OPERATION AND INSTALLATION MANUAL

BLIND ANTHEA

03MU002-D

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IND.	Author	Date	Description
A	JCN	2003	Initial Version
B			
C	EE	11/04/06	Addition Index modification – Correction scale 32 knots p°4, 23, 24
D	EE	27/03/07	RGD100 CONNECTING p°22

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CONTENTS

1. DESCRIPTION 3

1.1 EQUIPMENT DESCRIPTION 3
1.2 MAIN FEATURES 6
1.3 TECHNICAL FEATURES 7
1.4 SENSORS AND HULL FITTING 8

2. CHOICE OF HULL EQUIPMENT 9

2.1 SCREWED-TO-HULL-FITTING WITH VALVE TYPE 48.1.RVB WITH 48.1.RVB16 SENSOR OR 65.1.RVB WITH 65.2.RVB.20 SENSOR 11
2.2 WELDED-TO-HULL-FITTING WITH VALVE TYPE 48.1.RVI WITH 48.1RVB. 16 SENSOR OR 65.1.RVI WITH 65.2.RVB.20 SENSOR 13
2.3 SCREWED-TO-HULL-FITTING WITHOUT VALVE TYPE 48.1.RB OR 48.1.RBL WITH 48.1.RB OR 48.1.RVB SENSOR (DRAWING N° C1285/C1301) 14
2.4 WELDED-TO-HULL-FITTING WITHOUT VALVE TYPE 48.1.RI WITH 48.1.RB SENSOR 15
2.5 LENS PROBE WITH HULLFITTING MADE OF STAINLESS STEEL OR ALUMINIUM 16

3. INSTALLING THE ELECTRONIC UNIT 17

3.1 ELECTRONIC CASES : SIZE AND INSTALLATION 18
3.2 INSTALLING THE ANALOG SPEED AND DISTANCE REPEATER 19
3.3 SUB-SYSTEM CONNECTIONS 20
3.4 COMBINED SPEED AND DISTANCE REPEATER : INSTALLATION 21

4. TESTS, ADJUSTMENTS AND CALIBRATION UPON FIRST USE 23

4.1 LOG CALIBRATION 26
4.2 CALIBRATION OVER SHORT DISTANCES 27
4.3 DAMPING ADJUSTMENT 31

5. USE OF BLIND ANTHEA 32

5.1 LINEARITY ADJUSTMENT 32

6. SERIAL OUTPUT NMEA 0183 – IEC 61162-1 34

6.1 DATA TRANSMISSION 34
6.2 FORMAT OF SENTENCE INFORMATION 34
6.3 SENTENCE DESCRIPTION 34

DRAWINGS 36

EC TYPE EXAMINATION CERTIFICATE

BEN/I2E Marine Distributors

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1. DESCRIPTION

ANTHEA BLIND is a new generation of electromagnetic log. For standard operation, it uses model 48mm and LENS flat-surfaced sensors. It can be adapted to other BEN sensors having the same electrical characteristics.

ANTHEA BLIND includes an automatic gain adjustment for optimum accuracy and a calibration software facility. A permanent self-test signals any possible log faults on a programming consol.

1.1 EQUIPMENT DESCRIPTION

Standard equipment includes :

- ❒ one main cabinet giving the following data :
  - ♦ 1 mile totalizer
  - ♦ 1 daily mile totalizer
  - ♦ 1 RS 422 / 232 NMEA 0183 output (IEC 61162-1)
- ❒ 3 linearization points
- ❒ one 48.1.RVB16 sensor with 16m length cable, retractable at sea.
- ❒ one hull-fitting with valve, 48.1.RVB (retractable-valve-bronze alloy), screw-on type
  or
- ❒ one hull-fitting with valve, 48.1.RVI (retractable-valve-stainless), weld-on type.
- ❒ One Lens sensor with hull fitting for aluminium or steel hulls

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Options :

❒ GA 120 analog speed and distance repeater

scale - 2 + 16 knots
scale - 3 + 24 knots
scale - 5 + 25 knots
scale 0 + 48 knots
scale 0 + 32 knots

❒ RGD 100 combined repeater

- digital and pseudo-analog speed
- covered distance/with reset
- covered distance/without reset

❒ XY version

Available outputs are :

- current output 0.500µA which allows to connect an analog speed and distance repeater GA120 type
  (scale -2/+16 or -3/+24).
- one 1/10 mile output
- two 1/200 mile output
- one RS232 / RS 422 NMEA0183 output (IEC 61162-1)

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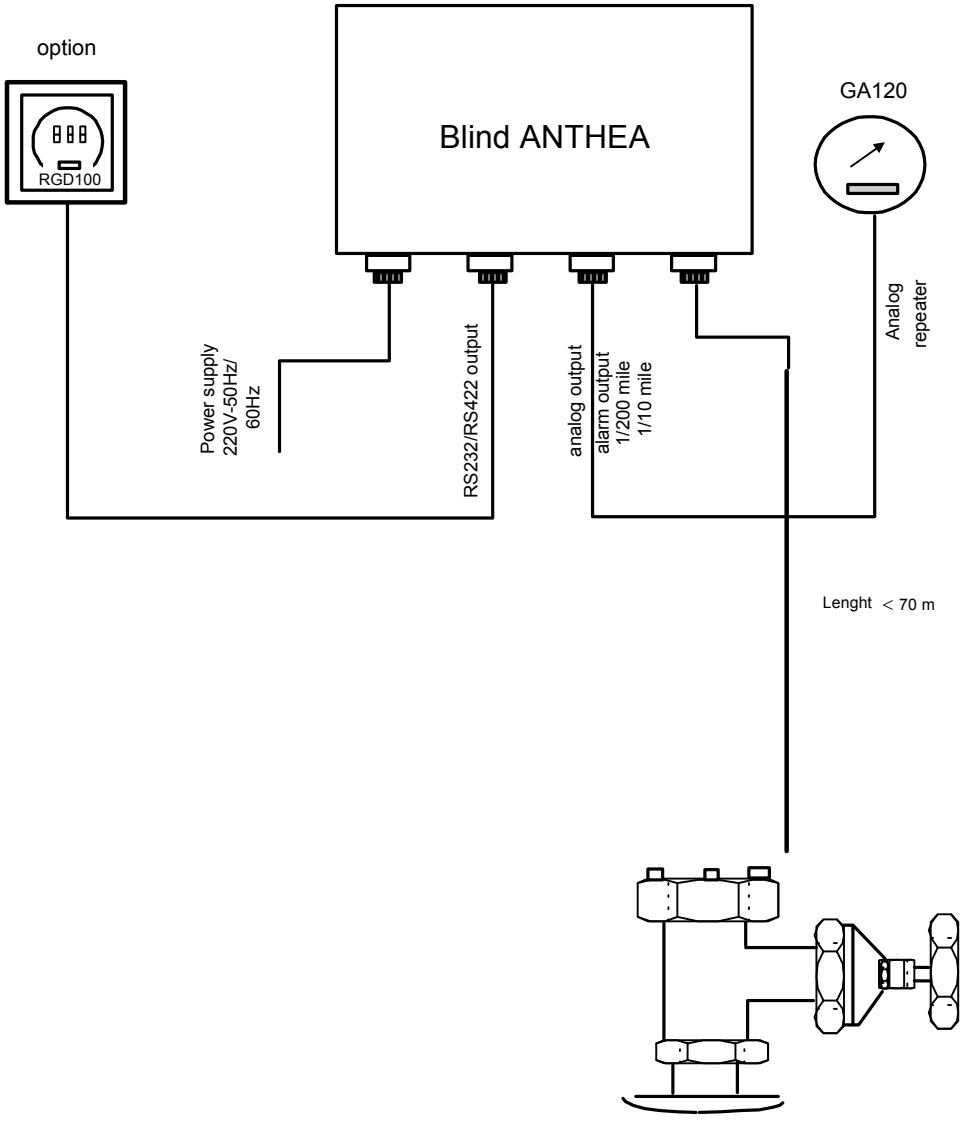
Installation plan (see plan 6631-M)

The blind ANTHEA' processing board is identical to the standard ANTHEA's one.



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1.2 MAIN FEATURES

❒ Watertight blind cabinet made of a molded alloy, flush mounted.

IP 65 watertightness
Size : 244 x 164 x 95 mm

❒ Programming consol for :

- Calibration 3-linearization-point adjustment and setting
- Service

Error message display
Display of :

longitudinal speed transversal speed resultant speed drift angle	for XY version (optional)

❒ Transmitted Data :

Digital speed :	0,1 knot definition
Covered distance/reset :	99999,9
Scale :	-5 or 50 knots
Test and alarm	

❒ Permanent self-test
❒ Automatical gain control
❒ Accuracy (after calibration) ± 2 % on the LCD display (The results are guaranteed for a depth > 3 meters)
❒ For a roll leading to an oscillation of ± 3 Knots of the displayed speed with a period of 4 seconds, the damping function of the equipment reduce this oscillation to a value inferior of ± 0,3 Knots.
❒ Variation of the displayed speed according to water temperature is less than 0,2 Knot.
❒ Variation of the displayed speed according to water salinity is less than 0,2 Knot.

Note : maximum length between sensor and electronic unit = Please refer to drawing "Cabling and installation configuration".

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1.3 TECHNICAL FEATURES

Power supply :

24 Vcc (+ 30 % - 10 %)
or 220V 50/60Hz (± 10 %)
Option : 110V 50/60 Hz (+/- 10 %)

Outputs :

2 x 1/200 mile, potential free contact outputs, 24V, 250mA
1 x 1/10 mile, open collector output, 24V, 500mA
1 x analog output 0 to 500 µA
1 x RS 422/ RS232 - NMEA 0183 format (IEC 61162-1)

Damping adjustment via 4-16-32 sec.strap

Equipment Description

P/N	Name	Qty	Weight	Description
PVBEN299/07	Main unit	1	4 kg	IP65 metal unit
PVBEN008	Sensor 48.1RVB16	1	4 kg	Retractable with 16m cable
PUBEN016	Hull fitting 48.1 RVI	1	5 kg	Weldable with valve
<u>Options</u>				
PVBEN299/09	XY version			
GALV 120	GA120 galvanometer		0,5 kg	
PVBEN295	RGD 100 Digital repeater		3 kg	Digital speed, distance and alarm repeater
Filscgp9822	2 shielded pairs cable			Sensor cable

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1.4 SENSORS AND HULL FITTING

Sensor type	Material	Hull fitting	Hull material	Drawing n°
48.1.RVB	Bronze alloy	**48.1.RVB** Hull fitting, bronze alloy, screw-on, valve, for sensor retractable at sea	Plastic fiber polyester Wood	D0342
48.1.RVB		**48.1.RVI** Stainless steel, weld-on, with valve, for sensor retractable at sea	Stainless steel	D0343
48.1.RB	Bronze alloy	**48.1.RB** Screw-on, without valve, for sensor retractable in dry dock	Plastic fiber polyester Wood	C1301
LENS		**LENS** weld-on, for sensor retractable by diver with no dry dock	Stainless steel or Aluminium	F0354M
48.1.RVB	Bronze alloy	**48.1.RBL** bronze alloy, screw-on, without valve, for thick hull mounting	Plastic fiber polyester Wood	C1285
48.1.RA	Aluminum	**48.1.RA** Aluminum weld-on, without valve, sensor retractable in dry dock	Aluminum	C1287

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2. CHOICE OF HULL EQUIPMENT

1. According to vessel size
   - Hull-fittings with valve (48.1 RVI - 48.1 RVB) or LENS
     . Are used on all types of vessels
   - Hull-fittings without valve (48.1 RB - 48.1 RA - 48.1 RBL - 48.1 RI) are used on :
     . 500 toners maximum
     . Fishing ships not longer than 45m
     . Yachts
2. Hull fitting cannot be used in dangerous compartments (fuel, hydrocarbons, chemicals).
3. Hull strength must be checked before installation of hull fitting.
4. Hull fitting must be installed in compliance with the specifications of the ship classification company.
5. Power supply wiring must comply with the specifications of the ship classification company.

Sensor location

The flush sensor must be installed in the foremost area of the vessel, when possible in a perpendicular position in the lower section of the bulb on the keel line. Deviation from the perpendicular measured in relation to the vessel's center line is not to exceed 5°.
In relation to the port/starboard yaw axis, deviation to a maximum of 30° may be permissible in particularly favorable conditions.
The installation position is to be at least 0.5m from echo sounder transmitter and similar devices;
The sensor must be positioned at least 10m away from corrosion protection electrodes. The maximum AC voltage component of the supply voltage of active corrosion protection electrodes is not to exceed 20mV eff.

The flat sensor surface measures the water speed along the hull. This measured speed is not equal to the vessel's true speed. Measured speed is lower than vessel's speed. At vessel's extreme fore, near true speed is obtained, but towards the aft of vessel speed value differs. The area along the hull where speed is different from vessel's speed is called the "boundary layer". Its thickness increases from fore to aft. The main cause is water running along the hull, which decreases up front. Because of the hull profile, hydrodynamic penetration coefficient is minimum in the fore.

Speed does not depend on fouling of the hull located in the boundary layer. Therefore, the ratio of the vessel's speed and measured speed is constant.

The sensor must be located near the bow, as far forward as possible. It must always remain immerged (if the sensor emerges occasionally, this can cause a short disturbance which doesn't effect the total distance information).

In order to protect the sensor against docking maneuvers, it is recommended to weld two strips on both sides of the sensor close to the hull-casing flanges. In order to avoid hydrodynamic disturbances, it is strongly suggested to profile these strips. Their dimensions will be calculated depending on the desired protection.

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The line joining the electrodes of the sensor must be perpendicular to the vessels longitudinal axis.

ATTENTION : It is mandatory to install the sensor in a dry area. In case of sustained immersion, it is strongly advised to use a special watertight sensor.

For vessels with a bulge bow, the area located within distance equal to twice the height of the bulge can be disturbed. The sensor must be preferably located in the bulge. When it is not possible to install the sensor up front, it is recommended to fix it on a streamlined bulge.

For special installation cases (bow thruster...), please contact an I2E/BEN Marine certified agent.

When the sensor is to be retracted from inside the hull, which is the general case, make sure that the sensor location is easily accessible, avoiding costly and long operations. Cargo holds, for instance, cannot be considered as accessible ; in this case, an I2E/BEN Marine certified agent will advise you.

General rules for sensor installation

Before proceeding or drilling, etc. make sure that there is room enough for retraction of the sensor and vital service work. If the hull plating is not flat enough at the selected area, it is necessary to flatten the hull or fit a flattened hull reinforcement.

Welding the hull casing to the hull requires special care. For welding to a carbon steel hull, use electrodes in austenitic alloy : 24 Cr, 12 Ni, 3 Mo or 20 Cr, 12 Ni, 3 Mo". Welding will be preferably made in argon atmosphere.

All BEN hull-fittings are fitted with a plastic outer cap (part n°16 on drawing D0343). **This part is vital and shall be carefully put in place and sticked using tightness cement during installation**. If broken, replace it immediately. A spare outer cap is always supplied either with the fitting or with the spares.

Fibered plastic or sandwich hulls : plastic hulls are not as resistant to screw pressure as metallic ones. Concerning sandwich hulls, the sandwiched materials must be replaced by a solid wooden ring or the equivalent. On standard plastic hulls, a large surface metallic washer can be placed inside and outside, under the condition that it is covered with plastic material joined smoothly to the hull surface. Tightness between hull and washer must be assured. For this type of hull, the inner part of the drilling must be covered for tightness by self polymerizing polyester.

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For wooden hulls, hull thickness (including the reinforcement) must be less than the total thickness the hull-fitting can tolerate. I2E/BEN Marine has developed systems for different thickenesses of hulls. Contact an I2E/BEN Marine agent for further information.

Anti-fouling paint must not be removed by abrasion. In certain cases, it is neither possible nor recommended to put the sensor immediately in its working position. In this case, it is necessary to prevent sensor (and connected-cable) damage until it is put in its final position.

When installation is over, do not forget to clean the sensor.

2.1 SCREWED-TO-HULL-FITTING WITH VALVE TYPE 48.1.RVB WITH 48.1.RVB16 SENSOR OR 65.1.RVB WITH 65.2.RVB.20 SENSOR

(Drawing n° D0342)

Steel hulls may be too thin and require suitable reinforcement : minimum total thickness must be 25 mm.
Check that actual thickness of the hull (including the reinforcement) is less than the tolerated thickness.

Note : Reinforcement is always recommended on any type of hull.

1. Remove the sensor from the hull-fitting and from piece (16). Remove the 0-rings.

2. Drill a 64.5 mm diameter hole in the hull for 48 sensors or 93 mm diameter hole for 65 sensors. Remember to flatten external surface in order to get a perfect bearing of piece (1). For plastic hull, take into acount the instruction § " General rules for senser installation ". Do an external chanfer (about 5 mm - 45°) for easy mounting and proper positioning of piece (1).

   Safety of the vessel deperds from Installation.

3. Position hull casing (1) and use self polymerizing mastic for tightness (rubber, silicone rilsan for example). Mastic layer must be thin. Let is harden to a pasty consistency.

4. Screw casing nut (2) on hull casing, and torque it with hammer or caulking tool. To avoid the hull casing from unscrewing, block it with a wedge.

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5. Screw the four thru-bolts ref (3) into the nut threaded holes (piece ref. 2) and butt them firmly against the hull plating in order to prevent future unscrewing of the nut. Safety is increased if a blind hole of a few mm depth is drilled facing the bolt. For plastic hulls, it is recommended to glue the nut to the hull with polymerizing fibered polyester.

6. Clean and grease 0-rings (11) an (12). Put them in place. Install the gate valve and properly adjust it (with regard to thru-bolt ref.3).

7. Put the upper 0-ring (6) in place in its landing, suitably greased. Install the upper flange (5).

8. Screw the safety nuts (19) on thru-bolt (3) forcing moderately and equally.

9. Put 0-ring (13) in place.

10. Fill the inner part of outer bush (16) with self polymerizing silicone rubber such as "syntofer". Remember to fill only the part indicated on D0342 drawing.

11. Introduce isolating part ref (16) with force. Make sure that it is properly positioned. Check that nothing protrudes and try to introduce the sensor from the outside. Let the mastic harden.

12. Grease flat seal (7) and put it in place.

13. Carefully lubricate the sensor and introduce it in its proper location. Take care to not grease the electrode.

14. Use grease supplied with spares. When properly positioned, the sensitive surface of the sensor protrudes at least 1 mm from external bush, and the red mark on the sensor head is directed towards the bow.

15. Fix sensor flange (8) with screws (9) and washers (20) ; put circlip 15. Connect the link (10). Check link length : it must be long enough to allow closing of the valve and short enough to prevent sensor from escaping and passing over 0-ring (6).

When using anti-fouling paint,

DOT NOT PAINT THE ELECTRODES - DO NOT GREASE THE LECTRODES

Note : to avoid sensor damage, it is recommended to put sensor in place just before departure, or while at sea (in this case, do not forget to close the valve).

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2.2 WELDED-TO-HULL-FITTING WITH VALVE TYPE 48.1.RVI WITH 48.1RVB. 16 SENSOR OR 65.1.RVI WITH 65.2.RVB.20 SENSOR

(Drawing n° D0343)

Drill a 77 mm diameter hole in the hull for 48 sensors and a 92 mm diameter hole for 65.2 sensors. Do an external chamfer of 5 mm (45°) for welding.

Prior to weld in the hull casing (1) the hull fitting is to be fully dismantled and O-rings are to be taken off.

1. Hull-casing (1) must be properly positioned, follow suggested procedure on drawing C1287. Weld the hull-fitting to he hull. After three or four spots have been welded on the internal side of the hull, remove the tools. Check that the lower part of hull-casing (1) does not protrude the hull, and grind the external seam flush with the hull.

   IMPORTANT : Hull-fitting mechanical tolerances are very precise. In order to avoid any possible damage, do not heat the hull-fitting when welding it.

2. Weld piece ref (2) on hull-casing (1).

3. Weld the four try-bolts (3) on lower flange (2) - might already be done in factory -

4. Clean and oil up bearing surface of 0-ring (11) and (12). Put them in place. Install and position the gate valve (4).

5. Put 0-ring (6) and position upper flange (5).

6. Screw nuts (19) - do not forget the washers (18) - on the thru-bolts (3).

7. Put the lower 0-ring seal ref (13) in place.
   Fill the inner part of the outer bush ref (16) with self polymerizing silicone rubber. Be careful to not over fill. Force the isolating part inside and clips it. Check positioning of hull-casing and also check that nothing protrudes inside by carefully introducing the sensor. Let the paste harden the time required.

8. Put flat seal (7) in place. Carefully lubricate the sensor and introduce it. Use grease supplied with spares.

9. When properly positioned, the sensitive surface of the sensor protrudes at least 1 mm from external bush, and the red mark on the head is directed towards the bow.

10. Fix sensor flange(8) with screws (9) and washers (20) ; put circlip 15.

11. Connect the link (10). Check link length : it must be long enough to allow closing of the valve and short enought to prevent sensor from escaping and passing over 0-ring (6).

To avoid sensor damage, it is recommended to put sensor in place just before departure, or while at sea (in this case, do not forget to close the valve). When using anti-fouling paint.

DO NOT PAINT THE ELECTRODES - DO NOT GREASE THE ELECTRODES

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2.3 SCREWED-TO-HULL-FITTING WITHOUT VALVE TYPE 48.1.RB OR 48.1.RBL WITH 48.1.RB OR 48.1.RVB SENSOR (Drawing n° C1285/C1301)

Above fittings are in bronze (48 RB) or in aluminum (48 RA) according to the sensor material (C1287). Those fittings are convenient for hulls not over 30 mm thickness, including hull reinforcement. Minimum clearance for sensor retraction is 150 mm distance from inside hull. For thick hulls, a longer hull-fitting has been designed (see drawing C1285 ; 48 RBL hull-fitting). This hull-fitting concerns only wooden vessels. Maximum thickness of the hull is 110 mm. Minimum clearance for sensor retraction is 410 mm. A threaded cap ref (25) is supplied with the hull-fitting in order to obturate the opening when the sensor is removed.

1. Drill a 64.5 mm diameter hole in the hole for 481 sensors. Remember to flatten external surface in order to get a perfect bearing of piece (1). Do an external chamfer (about 5 mm - 45° -) for easy mounting and proper positioning.

2. Position hull-casing (1). Tightness is obtained by a self polymerizing silicone rubber in order to prevent rotation of the body when unscrewing.

3. Fill the inner part of outer bush ref (16) with the mastic mentioned above. Be careful to fill only the part indicated on drawing C1301. Force the bush, check that the bush is properly clipsed and that nothing protrudes. Test the clearance by introducing the sensor preferably from outside. Let the paste harden.

4. Put the washer (24) and the nut (23). The nut (23) must be locked by a conventional mechanical system (refer to the drawing). As to the RBL hull-fitting, it is possible to add a second nut acting as a lock-nut (see drawing C1285).

5. Position 0-ring (13) - previously greased - and flat seal (7) and carefully introduce the sensor.

   Take care to not grease the electrode.

   Use grease supplied with spares.

   When using anti-fouling paint,

   DO NOT PAINT THE ELECTRODES.

   Attention : Red mark on sensor-head must be directed towards the bow.

6. Screw sensor nut (8). Do not forget the circlips (15).

   DO NOT GREASE THE ELECTRODES

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2.4 WELDED-TO-HULL-FITTING WITHOUT VALVE TYPE 48.1.RI WITH 48.1.RB SENSOR

(Drawing n° C1287)

1/ Drill a 77 mm diameter hole in the hull. Do an external chamfer of 5 mm (45°) for welding.

2/ Position hull-casing (1). To obtain accurate positioning, follow suggested procedure on the drawing. After three or four spots have been welded on internal side of hull, remove the mechanical system and check the positioning. Hull-casing must be flush with the hull. After welding, grind the external seam on a level with hull surface in order to allow piece (16) to butt on piece (1).

<u>IMPORTANT</u> : Hull-fitting mechanical tolerances are adjusted. In order to avoid any destroying risk, do not heat the hull-fitting when welding it.

3/ Fill the inner part of outer bush ref (16) with self polymerizing silicone rubber. Fill only the part indicated on the drawing. Replace the bush, check that bush is properly clipsed and that nothing protrudes. Test the clearance by introducing the sensor preferably from outside. Let the paste harden.

In most cases, lower flange (2) is already welded to hull casing (1).

4/ Weld the thru-bolts (3).

5/ Grease 0-ring (13) and position it.

6/ Do not forget flat seal (7). Introduce and grease the sensor. Install sensor-flange (8). Screw the thru-bolts with (19) + (18). Do not forget circlips (15).

Attention : To introduce sensor, use grease supplied with spares. When using anti-fouling paint, DO NOT PAINT THE ELECTRODES, DO NOT GREASE THE ELECTRODES. When properly positioned, the sensitive surface of the sensor protrudes at least 1 mm from external bush. The red mark on the sensor head is directed towards the fore of the vessel.

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2.5 LENS PROBE WITH HULLFITTING MADE OF STAINLESS STEEL or Aluminium

A/ INSTALLATION PROCEDURE

1. Drill a 184mm hole in the hull. Do an external chamfer of 5mm (45°) for welding.

2. Position hull-fitting in the correct mounting direction.

The reference mark drawn on hull-fitting is oriented towards bow, it must be exactly parallel to the vessel axis.
The hull-fitting defines the mounting direction of the lens probe.

When the hull-fitting is welded, grind the external seam on a level with hull surface in order not to create hydraulic interferences around the probe.

3. Weld a steel pipe to back of hull-fitting.
Ø = 40mm - Thickness = Minimum 5mm
This pipe will be stopped at 50mm above maximum waterline.

4. Introduce the probe after pulling watertight cable into the pipe.

5. Brush probe bottom with watertight rubber before fixing it with its 4 screws.

Caution : DO NOT GREASE THE ELECTRODES.
When using anti-fouling paint, DO NOT PAINT THE ELECTRODES.

B/ DISMOUNTLING AND CHANGING OF SENSOR

1/ Cut off power supply of the electronic.
2/ Disconnect the watertight cable sensor from the electronic.
3/ Strongly attach the watertight cable to a rope of at least the lenght of pipe.
4/ Send a diver to unscrew the four fixation screws of sensor.
5/ Screw-up the two extraction screws in order to push out the sensor from its hullfitting.
6/ Extract the complete defective sensor with its watertight cable and the rope attached to it.
7/ Strongly attach the new sensor's watertight cable to the rope and pull back up the cable for a new connection.

Caution : Before replacing the sensor in its hullfitting, don't forget to apply the watertight o'ring by silicone mastic.

This equipment is DNV and GL typed approved.

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3. INSTALLING THE ELECTRONIC UNIT

The BLIND ANTHEA can be flush mounted on to the bulkhead at any angle attached with 4 screws.

◊ The cover of the BLIND ANTHEA is hinged. Leave enough space on the left side for opening.

◊ After terminal connecting, pull out as many wires as possible before tightening stuffing boxes in order to limit HF radiations inside unit.

◊ If wires are hardened, they should not be hardened beyond stuffing boxes input and should be grounded to casing via stuffing boxes.

The equipment is designed for a battery power supply of 24 volts -10% +30%. Its average consumption is 200 mA.

The BLIND ANTHEA is protected against polarity reversal of the power supply ; if it does not work, reverse the wires.

The sensor cable is 16 meters long. For greater lengths (up to 150 m), use two junction boxes and two separate shielded cables (see drawing on next page).

For a 24 V power supply, the value of the fuse is 1A.
For a 220 V power supply, the value of the fuse is 125mA.

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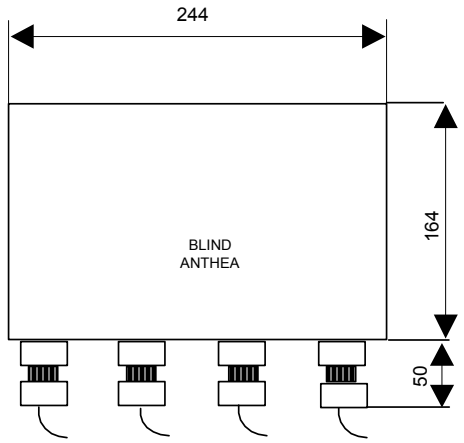
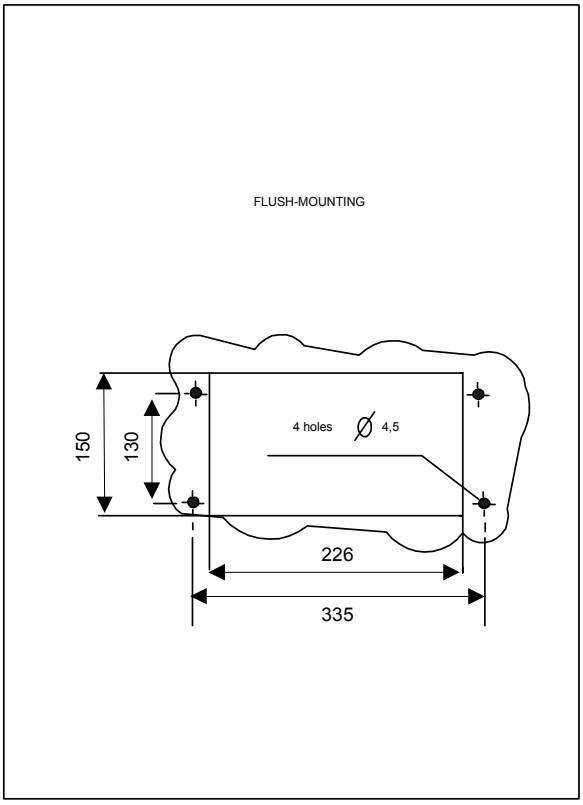
3.1 ELECTRONIC CASES : SIZE AND INSTALLATION

BLIND ANTHEA
MOUNTING





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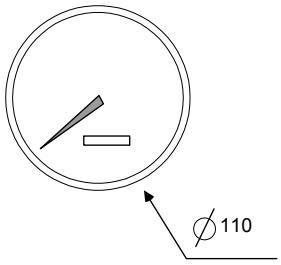
3.2 INSTALLING THE ANALOG SPEED AND DISTANCE REPEATER

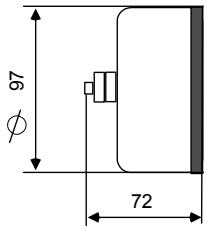
The speed and distance repeater is a wide-angle galvanometer with a waterproof front surface.

It can be placed on an outside panel. The rear part of this panel however, must be protected from water projections.

This repeater also has a 12V - 35 mA lighting. Power supply comes from the ANTHEA.

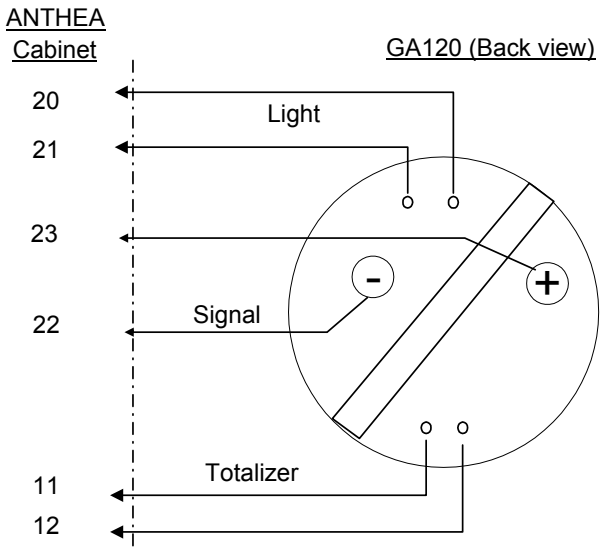
ANALOG SPEED AND DISTANCE REPEATER GA120





GA120 (Front view)

GA120 CONNECTIONS



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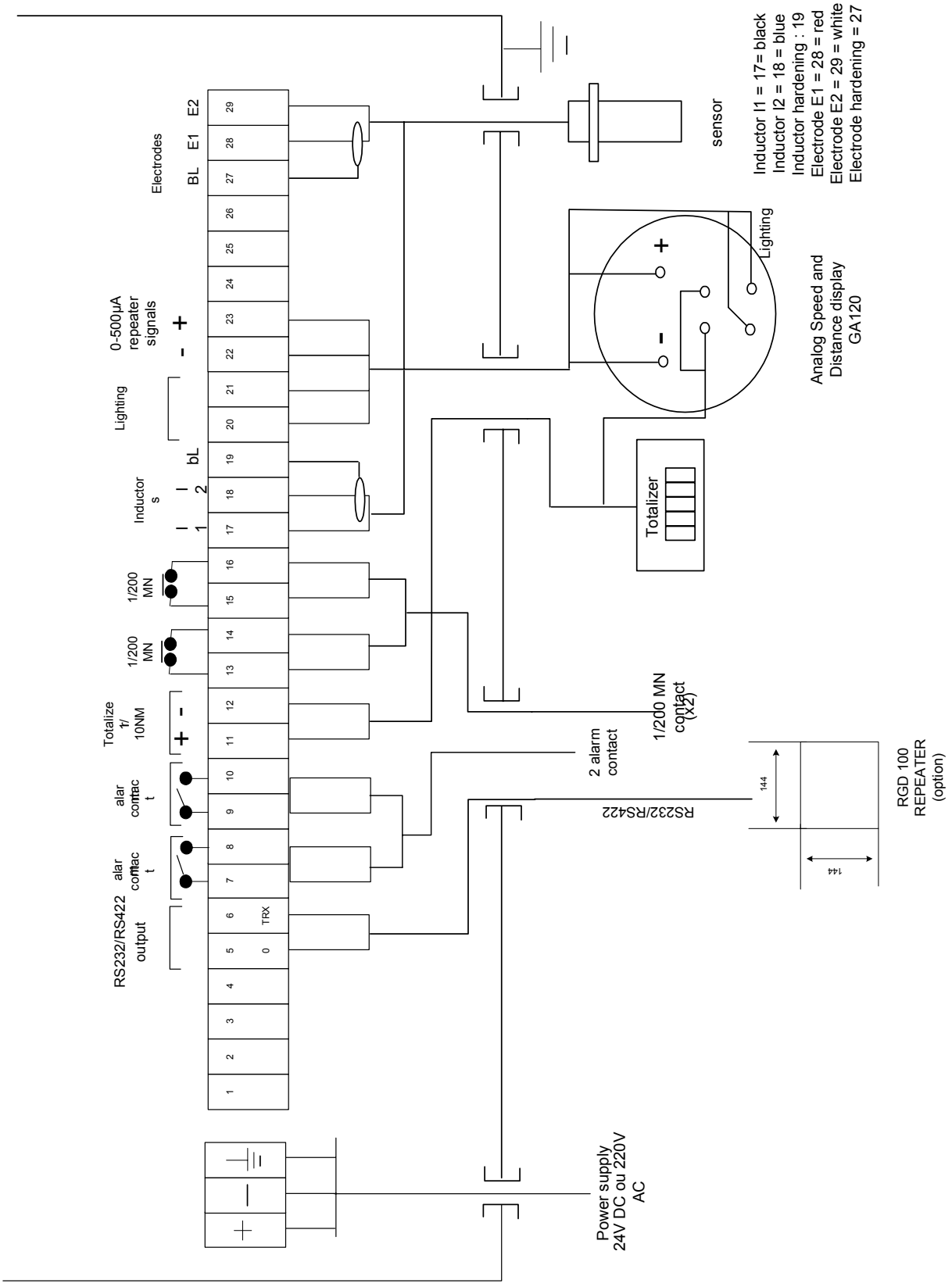
3.3 SUB-SYSTEM CONNECTIONS

ANTHEA CONNECTIONS



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3.4 COMBINED SPEED AND DISTANCE REPEATER : INSTALLATION

The repeater is a 144 x 144 mm watertight case.

It shows :

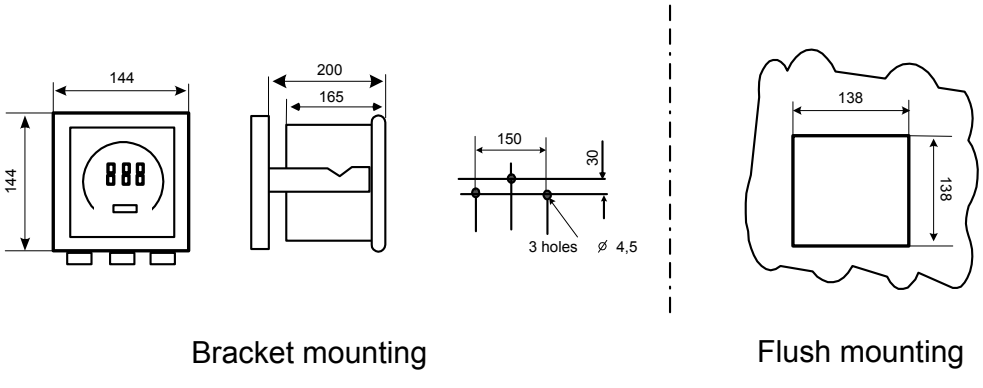
Digital and pseudo-analog speed 1/20 knot definition
Distance/reset : 1/10 mile definition

Log status (test - alarms)
Reset and brightness control are on front panel

Power supply : 24V -10 % to 30 %

Wiring is made via terminal and stuffing box, 5 repeaters can be connected

RGD100 REPEATER



Bracket mounting

Flush mounting

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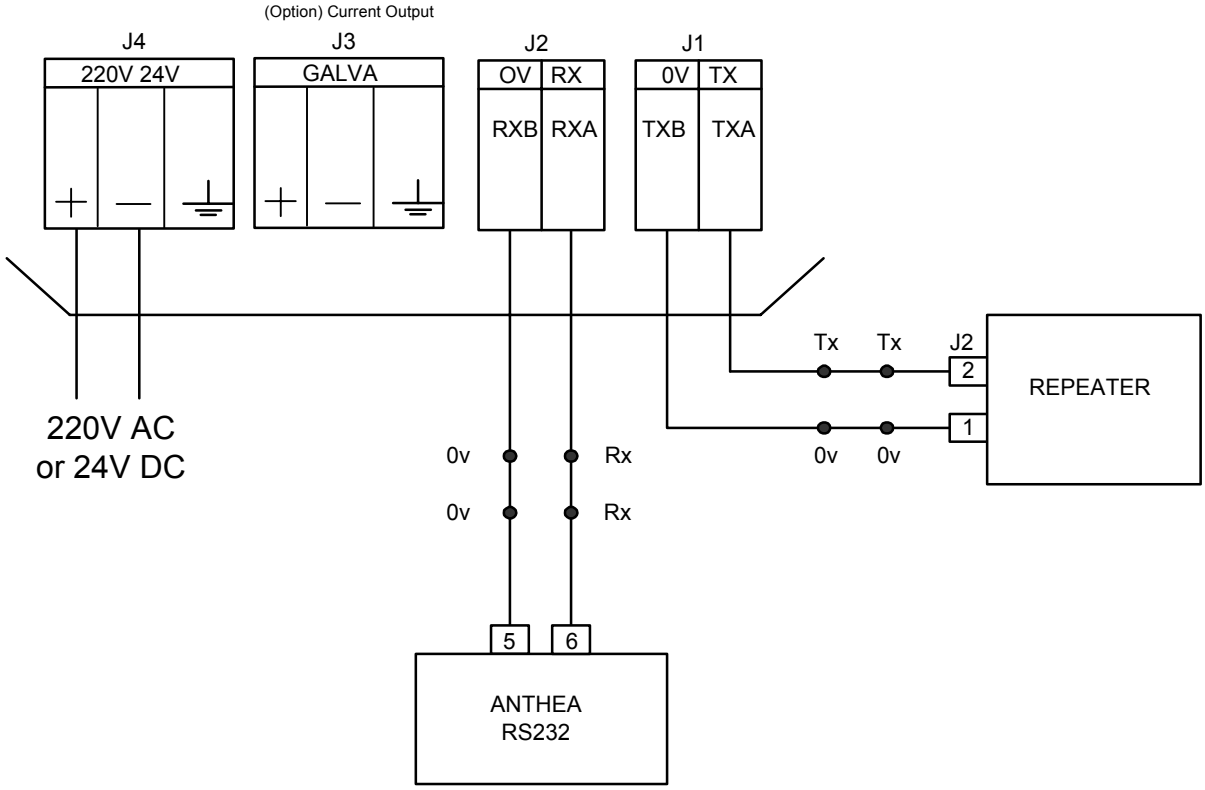
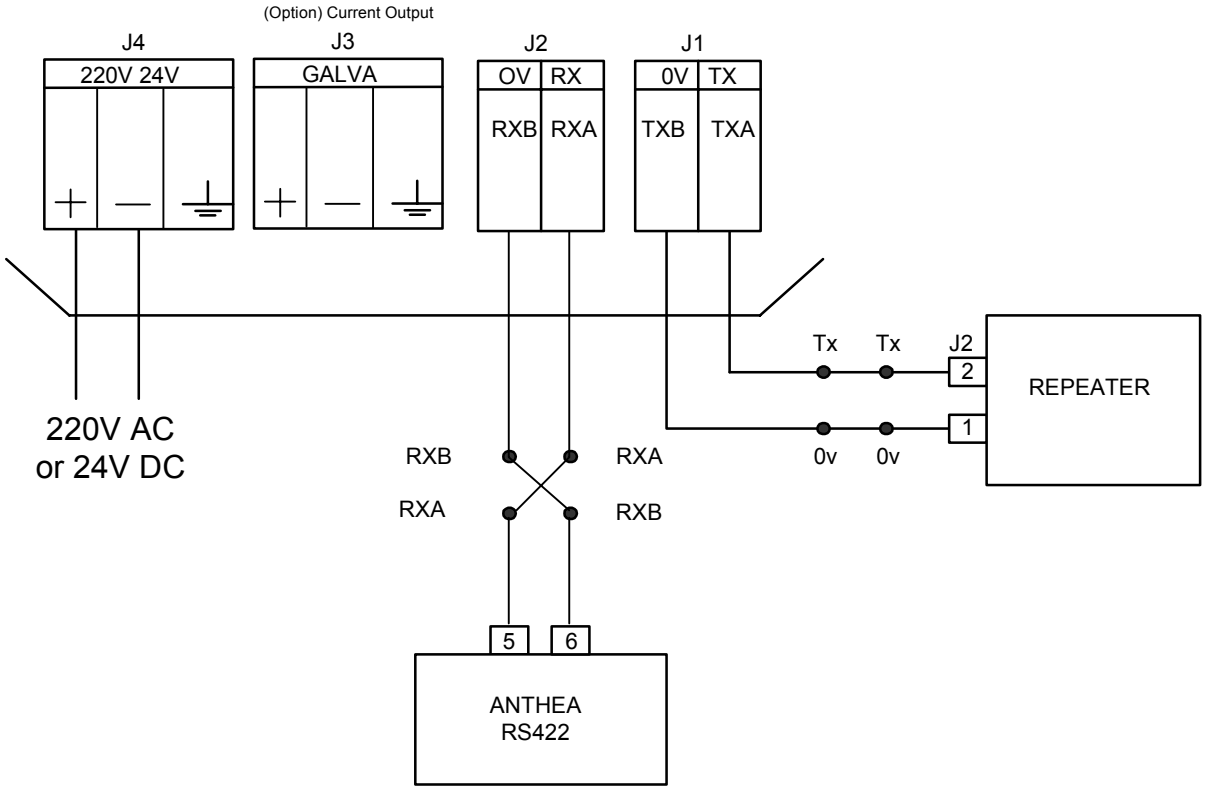
RGD100 CONNECTING

RGD100 RS232



RGD100 RS422



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4. TESTS, ADJUSTMENTS AND CALIBRATION UPON FIRST USE

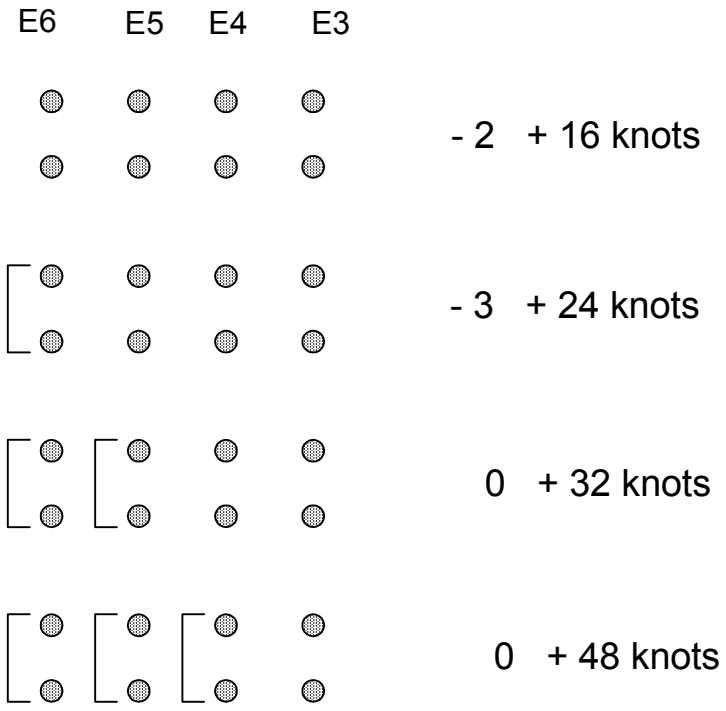
Preliminary tests

Once installation is completed, a first test must be performed before turning the power on.

Open the BLIND ANTHEA and move the Normal - Test switch (S1) to the Test position. Turn the button clockwise to turn the device on. If nothing appears on the speed repeater, this means that the ANTHEA is not receiving any current.
Check the battery charge, then the fuse.

When working, the log is at about 80 % of the scale in Test mode.

In case a GA120 galvanometer is used, make sure that strap position corresponds to the galvanometer scale, that is :



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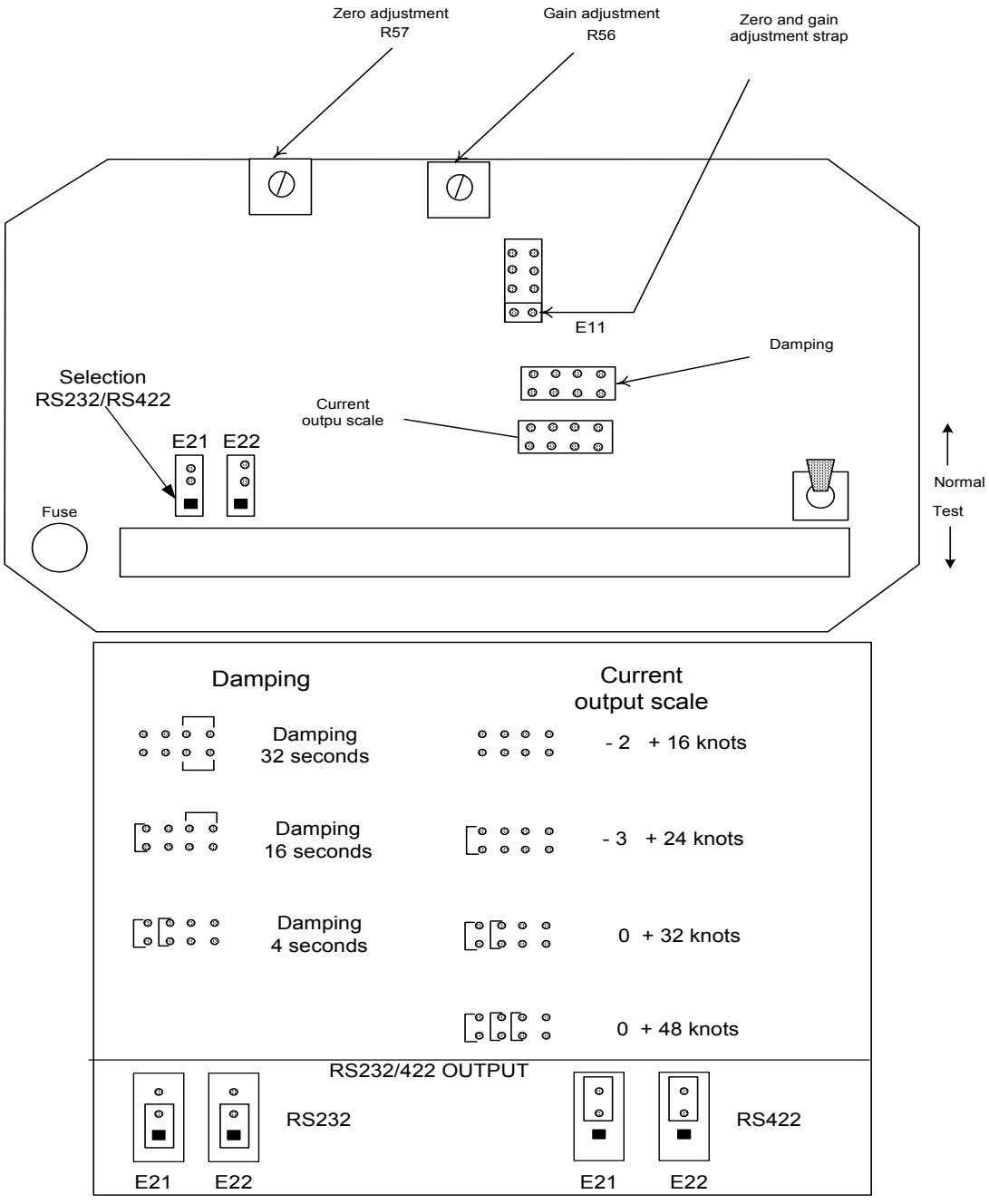
BLIND ANTHEA BOARD STRAP POSITIONS



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Zero adjustment

When ship is motionless on dead calm water, speed can be above zero. You then have to correct this zero shifting.

Make sure there is no undertow.

You can easily check it by putting sensor back to front to check zero does not change.

If it does, zero can be adjusted by equalizing absolute speed values when sensor is in normal position and is back to front. Do not forget then to put sensor back in correct position (red mark towards ship bow).

Zero adjustment process	E15
Put strap E11	E13
Adjust with R57 potentiometer	E12
Once adjustment has been archieved, take strap E11 off so as to set it	E11

Gain adjustment process

Switch "TEST" mode on, and wait a few seconds till speed stabilizes.
Note test value.
Calculate new test value, i.e. :

Example : Indicated speed on "TEST" position is 20 knots and we want to correct gain by -0,8 %.

$$\frac{20.0 \times 0,8}{100} = 19,84 \text{ knots}$$

Gain adjustment process

Gain adjustment process	E15
Strap E11	E13
Adjust gain with R56 potentiometer	E12
Once gain has been adjusted, take strap E11 off, so as to set adjustment	E11

Switch to "NORMAL" position.

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4.1 LOG CALIBRATION

An E/M log measures speed and distance in relation to water. When there is no current, the distance indicated by the log is the distance in relation to the bottom or the true distance.

Several methods can be used :

a) Empirical method

Using the average of the measurements of long distances covered in comparison with the actual distances.

b) Rational method

Using the measurements of speed in covering the same base distance several times.

The device is set for the average sensitivity of its sensors in the factory.

If the first method is used, calculate the average relative error for a certain number of runs at different times and with different tide levels, but at roughly the same speed.

It is convenient to calculate these errors in percentages. The average error is calculated by taking the average of the relative errors. A large enough number of runs must be made, as in the following tables :

Runs listed by order	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Error	- 2%	- 5%	+ 7%	- 6%	+ 2%	+ 1%	+ 4%	+ 3%	+ 1%	+ 3%

- 2 - 5 + 7 - 6 + 2 + 1 + 4 + 3 + 1 + 3 = + 8

The average relative error is $\frac{8}{10} = + 0{,}8\ \%$

The correction is : - 0,8 %

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4.2 CALIBRATION OVER SHORT DISTANCES

It is possible to calibrate the log with precision by covering a known base distance defined by alignment on the shore, preferably following a route defined by an alignment.

Calculating true or real speed :
Clock the time needed to cover the base distance : the true or real speed Vr is :

$$Vr = \frac{Dr}{Tr} \times 3600$$

Dr = Real distance covered
Tr = Time taken to cover the distance in seconds

The factor 3600 comes from the fact that the speed is measured in knots (miles per hour) and the time in seconds.

Calculation of the log speed

The log speed must not be read on the speed display as the measurement would not be precise enough. The average speed must be determined by clocking the time taken to complete the distance.

A second stop watch is useful, but if you only have one, the same method can be used by taking the times on the first stop watch as you go.

With a second stop watch, measure the time taken to cover the distance displayed on the distance counter. Start the stop watch as soon as the first one tenth of a mile figure changes after entering the base distance zone. Stop the stop watch when the base distance has been covered or just before reaching the end of the distance when the one tenth of a mile figure changes.
Do not change the speed or the direction of the boat until this measurement has been taken.

Log speed VI is : $V1 = \frac{D1}{T1} \times 3600$

Let Dd and Df respectively be the distances displayed at the beginning and at the end of the trip ; the distance displayed on the log will be :

$$D1 = Df - Dd$$

If the time measured between the display of Dd and Df is T1, the average speed indicated on the log is :

$$V1 = \frac{D1}{T1}$$

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Tr and T1 are not identical, since the beginning and the end of each of these timings are not identical.

If the base distance is long enough to be able to accept an approximation of a tenth of a mile, just not the indications on the distance counter upon entering and leaving the base distance zone.

The above measurements are to be taken over several runs.

a) When in a zone where the current remains constant throughout the tests, the base distance zone should be covered a second time in the opposite direction, carrying out the same operations. The average of the speeds obtained is then calculated :

$$\text{Vaverage} = \frac{V1 + V2}{2}$$

b) If the current is not constant, a third run in the same direction as the first will be made, as long as the tests are made consecutively with no time out between any two test runs. The average is calculated as follows :

$$\text{Vaverage} = \frac{V1 + 2V2 + V3}{4}$$

V1 = speed calculated on the first run
V2 = speed calculated on the second run
V3 = speed calculated on the third run

Always try to operate at the speed given by the log, modifying the engine speed controls if necessary.

Do not perform the measurements while the tide is turning.

Having found the average real speeds and the average log speeds, a simple calculation will provide the percentage of error of the log.

The percent error is :

$$\frac{100V1 + Vr}{V1}$$

This error may be positive or negative.

Example : suppose that 1.1 miles are covered in a clocked time of Tr1 = 364 seconds.

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The real speed will be :

$$\frac{1{,}1 \times 3600}{364} = 10{,}9 \text{ knots}$$

The average real speed will be :

$$\frac{10{,}1 + 10{,}9}{2} = 10{,}5 \text{ knots}$$

Suppose that during the first run over the base distance, the stop watch was started when the distance counter was at : **24.1 miles**, and that it was stopped when the distance counter was at : **25.4 miles**, the stop watch will have run 400 seconds.

The distance read from the distance counter will be : 25.4 - 24.1 = 1.3 mile.

Calculating the indicated speed gives :

$$\frac{1{,}3 \times 3600}{400} = 11{,}7 \text{ knots}$$

During the second run the stop watch was started when the distance counter was at **26.0 mile** and stopped when the distance counter was at **27.2 miles**, the stop will have run 372 seconds.

The distance read from the distance counter is : 27.2 - 26 = 1.2 miles.

The speed calculated is :

$$\frac{1{,}2 \times 3600}{372} = 11{,}6 \text{ knots}$$

The average value of the speeds indicated is :

$$\frac{11{,}7 + 11{,}6}{2} = 11{,}65 \text{ knots}$$

Error correction :

First evaluate the error in percentage.
In the above example, the error :

$$\frac{100 \times (11{,}65 - 10{,}5)}{11{,}65} = + 10\ \%$$

The correction to be made is therefore : - 10 %.

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Switch "TEST" on and wait a few seconds till speed display is stabilized.

Note test value.

Calculate new test value : for example :

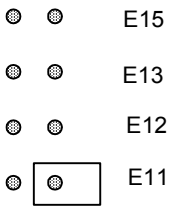
Test value = 18 knots

New value = $18 \text{ knots} - \frac{18 \times 10}{100} = 16{,}2 \text{ knots}$

Put-on strapp E11

Adjust potentiometer R56 so as to bring test value back to 16,2 knots.

Take off strapp E11
so as to set adjustment



Switch on "Normal" position (N).

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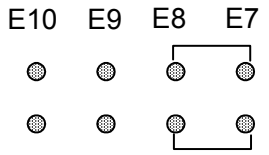
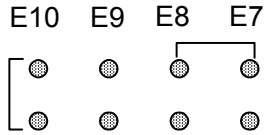
4.3 DAMPING ADJUSTMENT

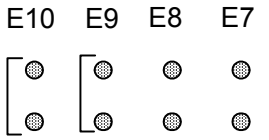
Three damping possibility are available : 4s, 16s, 32s.



Damping 32s



Damping 16s



Damping 4s

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5. USE OF BLIND ANTHEA

5.1 LINEARITY ADJUSTMENT

SPECIAL PROGRAMMING CONSOLE
FOR BEN E/M LOGS CALIBRATION

1/ Connect the Programming console on the Anthea log RS232 output (Sub D9 Connector P2)

2/ At first, all the calibration points are at zero. Proceed with the speed calculations to determine an error curve (true speed/sensor speed).

Example :

True speed (in knots)	Display speed (in knots)
10.4	11.5
18.2	19.4
26.1	27.6

Enter correction couples

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Display on Prog. consol	Press	Action
Adjust 1st linearization point (log speed) *1 Log speed xx.x 1 Log speed 10.4	ENTER 10.4	PRESS ENTER
Adjust 1st linearization point (true speed) * 1 True speed xx.x 1 True speed 11.5	ENTER 11.5	PRESS ENTER
Adjust 2nd linearization point (log speed) * 2 Log speed xx.x 2 Log speed 18.2	ENTER 18.2	PRESS ENTER
Adjust 2nd linearization point (true speed) * 2 True speed xx.x 2 True speed 19.4	ENTER 19.4	PRESS ENTER
Adjust 3rd linearization point (log speed) *3 Log speed xx.x 3 Log speed 26.1	ENTER 26.1	PRESS ENTER
Adjust 3rd linearization point (true speed) *3 True speed xx.x 3 true speed 27.6	ENTER 27.6	PRESS ENTER

0 knots corresponds to zero correction.

If all the values have been correctly programmed, the programming console displays : OK to confirm that all the parameters have been taken into account.

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6. SERIAL OUTPUT NMEA 0183 – IEC 61162-1

6.1 DATA TRANSMISSION

- baud rate 4800
- data bits 8 (D7 = 0) , parity none
- stop bits 1

6.2 FORMAT OF SENTENCE INFORMATION

Version single axis:

$ V M V H W , , , , , x x x . x x , N , , * h h <CR> <LF>

$ V M V L W , x x x x x . x , N , x x x x x . x , N * h h <CR> <LF>

$ P B E N , 0 1 , a a a a * h h <CR> <LF>

Version dual axis :

$ V M V H W , , , , , x x x . x x , N , , * h h <CR> <LF>

$ V M V L W , x x x x x . x , N , x x x x x . x , N * h h <CR> <LF>

$ P B E N , 0 1 , a a a a * h h <CR> <LF>

$ V M V B W , x x x . x x , x x x . x x , A , , , V , , V , , V * h h <CR> <LF>

6.3 SENTENCE DESCRIPTION

--. Water speed and heading

$ V M V H W , , , , , x x x . x x , N , , * h h <CR> <LF>

$ V M V H W : Start of sentence and identifier

x x x . x x : longitudinal water speed in Knots

N : Knots

hh : Cheksum

message recurrence 0.5 second

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--. Dual ground / water speed

$ V M V B W , x x x . x x , y y y . y y , A , , , V , , V , , V * h h <CR> <LF>

$ V M V B W : Start of sentence and identifier

x x x . x x : Longitudinal water speed , knots

y y y . y y : Transversal water speed, knots

A : data valid , **V :** data invalid

hh : Cheksum

message recurrence 0.5 second

-- Distance travelled through the water

$ V M V L W , x x x x x . x , N , y y y y y y . y , N* h h <CR> <LF>

$ V M V L W : Start of sentence and identifier

x x x x x . x : Total cumulative distance, nautical miles

y y y y y . y : Distance since reset, nautical miles

N: nautical miles

hh : Cheksum

message recurrence 1 second

-- Proprietary sentences

$ P B E N , 0 1 , a a a a * h h <CR> <LF>

$ P B E N , 0 1 , : Start of sentence and identifier

a a a a : alarms

hh : Cheksum

message recurrence 1 second

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DRAWINGS

N°	Cabling and installation configuration
C1285	Probe 48.1 RVB/hullfitting 48.I RBL
C1287	Probe 481 RA/hullfitting 48.1 RA Probe 481 RB/hullfitting 48.1 RI
C1301	Probe 481RB/hullfitting 48.1 RB
D0342	Probe 48.1 RVB/hullfitting 48.1 RVB Probe 65.2 RVB/hullfitting 65.1 RVB
D0343	Probe 48.1 RVB/hullfitting 48.1 RVI Probe 65.2 RVB/hullfitting 65.1 RVI
11850-C BSR	Cabling
F0189-C	DOB Connection
F0256-C	DOB Configuration
F0344-M	DOB 232/422 Outlines and mounting
6631-M	Blind ANTHEA : size and installation
7851-M	“ Lens ” sensor and hullfitting
F0354-M	“Lens” sensor and Aluminium hullfitting

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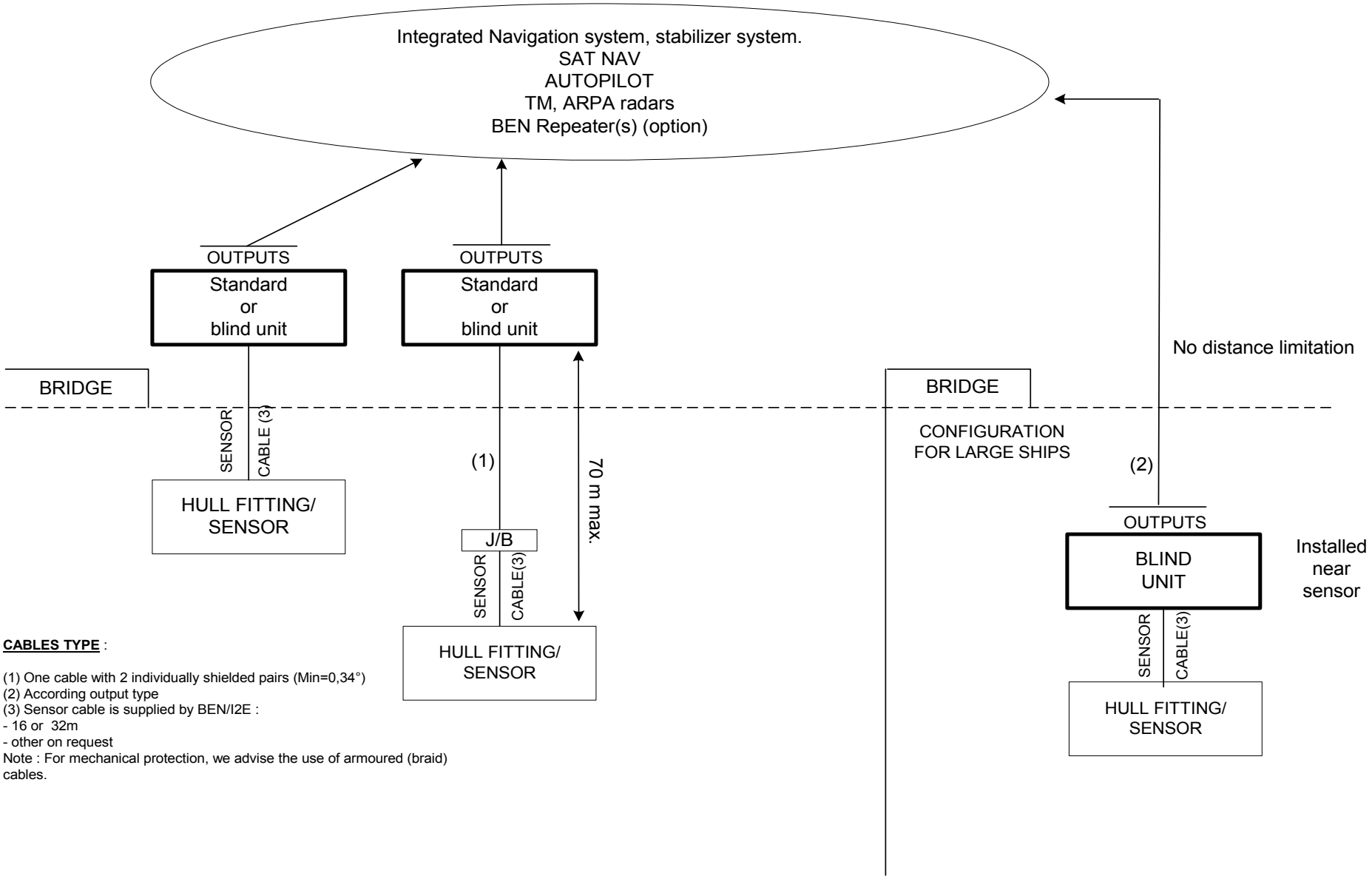
CABLING AND INSTALLATION CONFIGURATION



CABLES TYPE :

(1) One cable with 2 individually shielded pairs (Min=0,34°)
(2) According output type
(3) Sensor cable is supplied by BEN/I2E :
- 16 or 32m
- other on request

Note : For mechanical protection, we advise the use of armoured (braid) cables.

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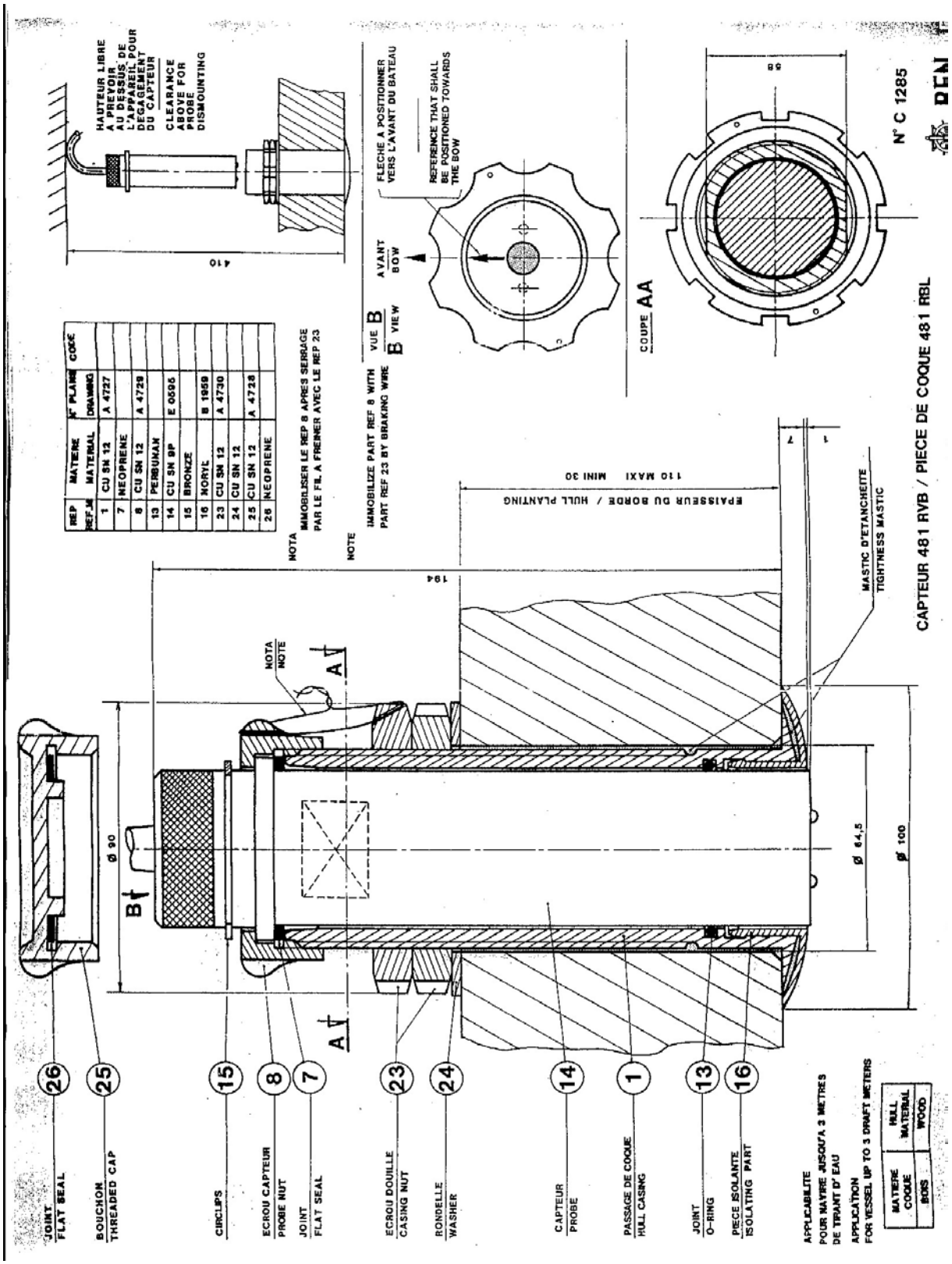
CAPTEUR 481 RVB / PIECE DE COQUE 481 RBL
N° C 1285
DCN
HAUTEUR LIBRE A PREVOIR AU DESSUS DE L'APPAREIL POUR DEGAGEMENT DU CAPTEUR
CLEARANCE ABOVE FOR PROBE DISMOUNTING
410
FLECHE A POSITIONNER VERS L'AVANT DU BATEAU
REFERENCE THAT SHALL BE POSITIONED TOWARDS THE BOW
VUE B / B VIEW
AVANT BOW
COUPE AA
NOTA
IMMOBILISER LE REP 8 APRES SERRAGE PAR LE FIL A FREINER AVEC LE REP 23
NOTE
IMMOBILIZE PART REF 8 WITH PART REF 23 BY BRAKING WIRE
REP / REF N° | MATIERE / MATERIAL | N° PLANS / DRAWING | CODE
1 | CU SN 12 | A 4727
7 | NEOPRENE
8 | CU SN 12 | A 4729
13 | PERBUNAN
14 | CU SN 8P | E 0596
15 | BRONZE
16 | NORYL | B 1959
23 | CU SN 12 | A 4730
24 | CU SN 12
25 | CU SN 12 | A 4728
26 | NEOPRENE
EPAISSEUR DU BORDE / HULL PLANTING
110 MAXI MINI 30
194
MASTIC D'ETANCHEITE
TIGHTNESS MASTIC
Ø 90
Ø 64,5
Ø 100
JOINT / FLAT SEAL
BOUCHON / THREADED CAP
CIRCLIPS
ECROU CAPTEUR / PROBE NUT
JOINT / FLAT SEAL
ECROU DOUILLE / CASING NUT
RONDELLE / WASHER
CAPTEUR / PROBE
PASSAGE DE COQUE / HULL CASING
JOINT / O-RING
PIECE ISOLANTE / ISOLATING PART
APPLICABILITE POUR NAVIRE JUSQU'A 3 METRES DE TIRANT D' EAU
APPLICATION FOR VESSEL UP TO 3 DRAFT METERS
MATIERE COQUE / HULL MATERIAL
BOIS / WOOD

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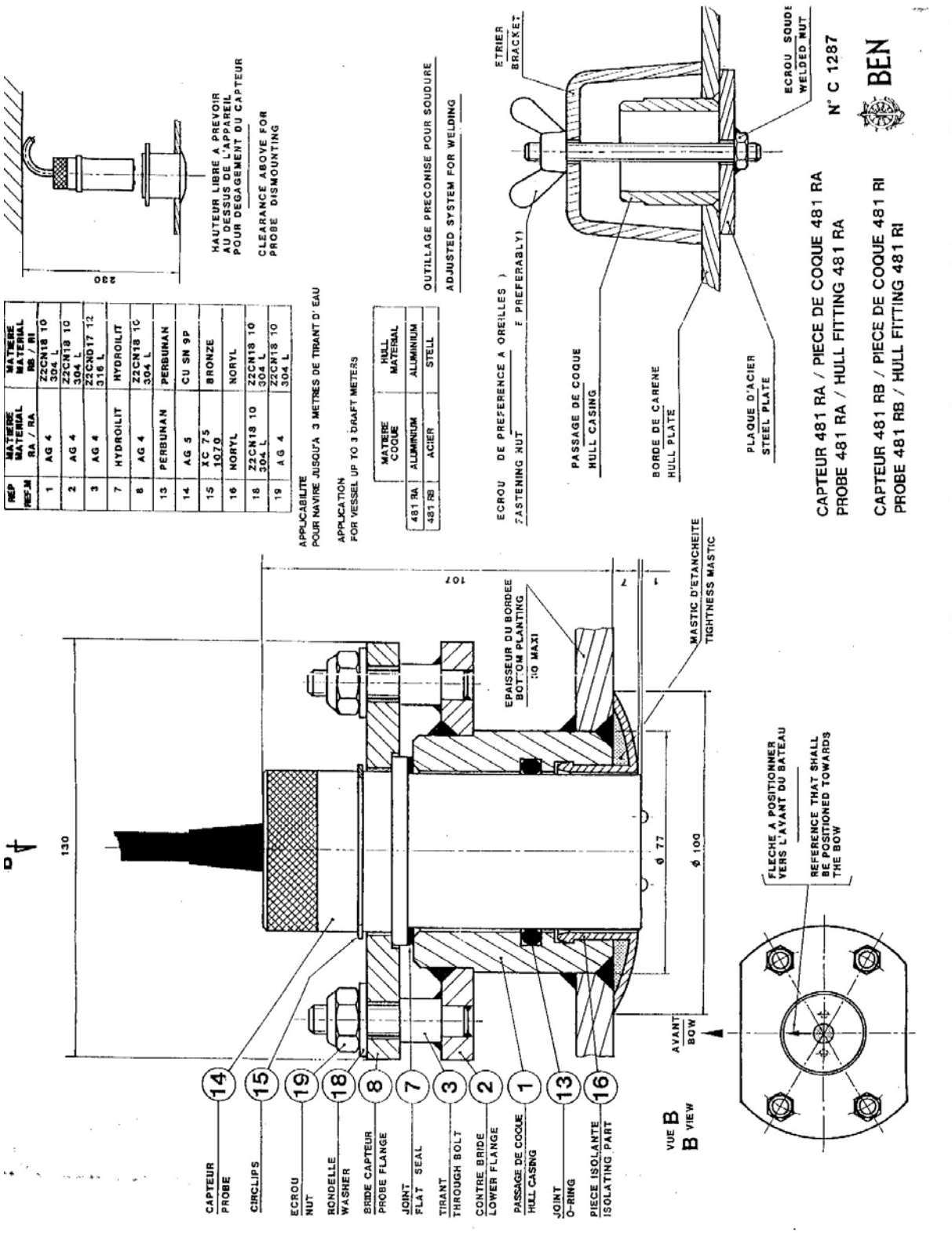
CAPTEUR 481 RA / PIECE DE COQUE 481 RA
PROBE 481 RA / HULL FITTING 481 RA
CAPTEUR 481 RB / PIECE DE COQUE 481 RI
PROBE 481 RB / HULL FITTING 481 RI
N° C 1287
BEN
CAPTEUR PROBE
CIRCLIPS
ECROU NUT
RONDELLE WASHER
BRIDE CAPTEUR PROBE FLANGE
JOINT FLAT SEAL
TIRANT THROUGH BOLT
CONTRE BRIDE LOWER FLANGE
PASSAGE DE COQUE HULL CASING
JOINT O-RING
PIECE ISOLANTE ISOLATING PART
MASTIC D'ETANCHEITE TIGHTNESS MASTIC
EPAISSEUR DU BORDEE BOTTOM PLANTING 10 MAXI
ETRIER BRACKET
ECROU SOUDE WELDED NUT
PASSAGE DE COQUE HULL CASING
BORDE DE CARENE HULL PLATE
PLAQUE D'ACIER STEEL PLATE
ECROU DE PREFERENCE A OREILLES) FASTENING NUT (PREFERABLY
OUTILLAGE PRECONISE POUR SOUDURE
ADJUSTED SYSTEM FOR WELDING
APPLICABILITE
POUR NAVIRE JUSQU'A 3 METRES DE TIRANT D' EAU
APPLICATION
FOR VESSEL UP TO 3 DRAFT METERS
HAUTEUR LIBRE A PREVOIR AU DESSUS DE L'APPAREIL POUR DEGAGEMENT DU CAPTEUR
CLEARANCE ABOVE FOR PROBE DISMOUNTING
FLECHE A POSITIONNER VERS L'AVANT DU BATEAU
REFERENCE THAT SHALL BE POSITIONED TOWARDS THE BOW
VUE B
B VIEW
AVANT
BOW
130
107
7
Ø 77
Ø 100
230

REP / ITEM	MATIERE MATERIAL RA / RA	MATIERE MATERIAL RB / RI
1	AG 4	Z2CN18 10 304 L
2	AG 4	Z2CN18 10 304 L
3	AG 4	Z2CND17 12 316 L
7	HYDROILIT	HYDROILIT
8	AG 4	Z2CN18 10 304 L
13	PERBUNAN	PERBUNAN
14	AG 5	CU SN 9P
15	XC 75 1070	BRONZE
16	NORYL	NORYL
18	Z2CN18 10 304 L	Z2CN18 10 304 L
19	AG 4	Z2CN18 10 304 L

MATIERE COQUE	HULL MATERIAL
481 RA ALUMINIUM	ALUMINIUM
481 RB ACIER	STELL

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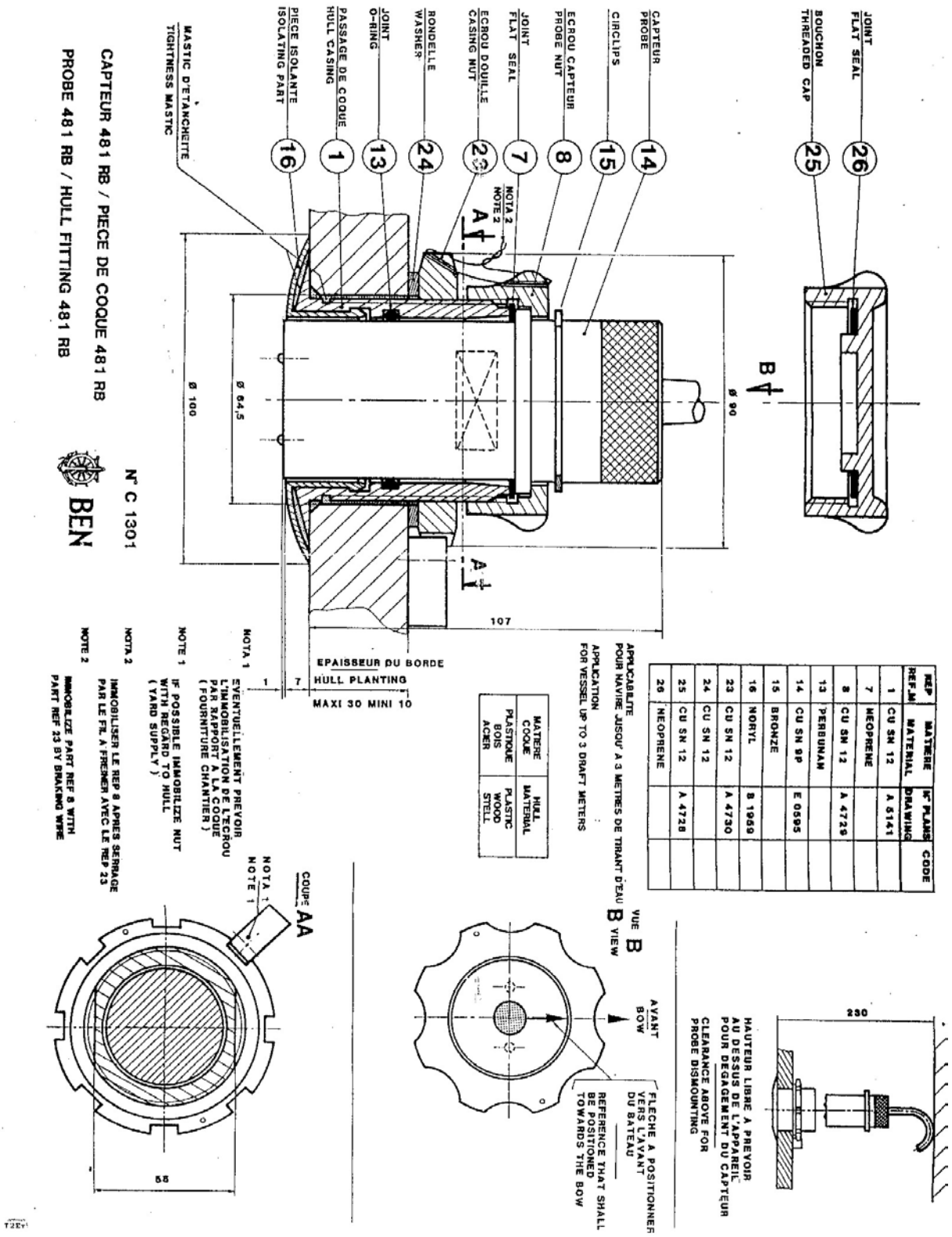
CAPTEUR 481 RB / PIECE DE COQUE 481 RB
PROBE 481 RB / HULL FITTING 481 RB
BEN
N° C 1301
JOINT FLAT SEAL
BOUCHON THREADED CAP
CAPTEUR PROBE
CIRCLIPS
ECROU CAPTEUR PROBE NUT
JOINT FLAT SEAL
ECROU DOUILLE CASING NUT
RONDELLE WASHER
JOINT O-RING
PASSAGE DE COQUE HULL CASING
PIECE ISOLANTE ISOLATING PART
MASTIC D'ETANCHEITE TIGHTNESS MASTIC
NOTA 2 NOTE 2
Ø 100
Ø 64,5
Ø 90
107
EPAISSEUR DU BORDE
HULL PLANTING
MAXI 30 MINI 10
APPLICABILITE
POUR NAVIRE JUSQU' A 3 METRES DE TIRANT D'EAU
APPLICATION
FOR VESSEL UP TO 3 DRAFT METERS
MATIERE COQUE / HULL MATERIAL
PLASTIQUE / PLASTIC
BOIS / WOOD
ACIER / STELL
REP REF.N° | MATIERE MATERIAL | N° PLANS DRAWING | CODE
1 CU SN 12 A 5141
7 NEOPRENE
8 CU SN 12 A 4729
13 PERBUNAN
14 CU SN 9P E 0595
15 BRONZE
16 NORYL B 1959
23 CU SN 12 A 4730
24 CU SN 12
25 CU SN 12 A 4728
26 NEOPRENE
NOTA 1
EVENTUELLEMENT PREVOIR L'IMMOBILISATION DE L'ECROU PAR RAPPORT A LA COQUE (FOURNITURE CHANTIER)
NOTE 1
IF POSSIBLE IMMOBILIZE NUT WITH REGARD TO HULL (YARD SUPPLY)
NOTA 2
IMMOBILISER LE REP 8 APRES SERRAGE PAR LE FR. A FREINER AVEC LE REP 23
NOTE 2
IMMOBILIZE PART REF 8 WITH PART REF 23 BY BRAKING WIRE
COUPE AA
55
VUE B
B VIEW
AVANT BOW
FLECHE A POSITIONNER VERS L'AVANT DU BATEAU
REFERENCE THAT SHALL BE POSITIONED TOWARDS THE BOW
230
HAUTEUR LIBRE A PREVOIR AU DESSUS DE L'APPAREIL POUR DEGAGEMENT DU CAPTEUR
CLEARANCE ABOVE FOR PROBE DISMOUNTING

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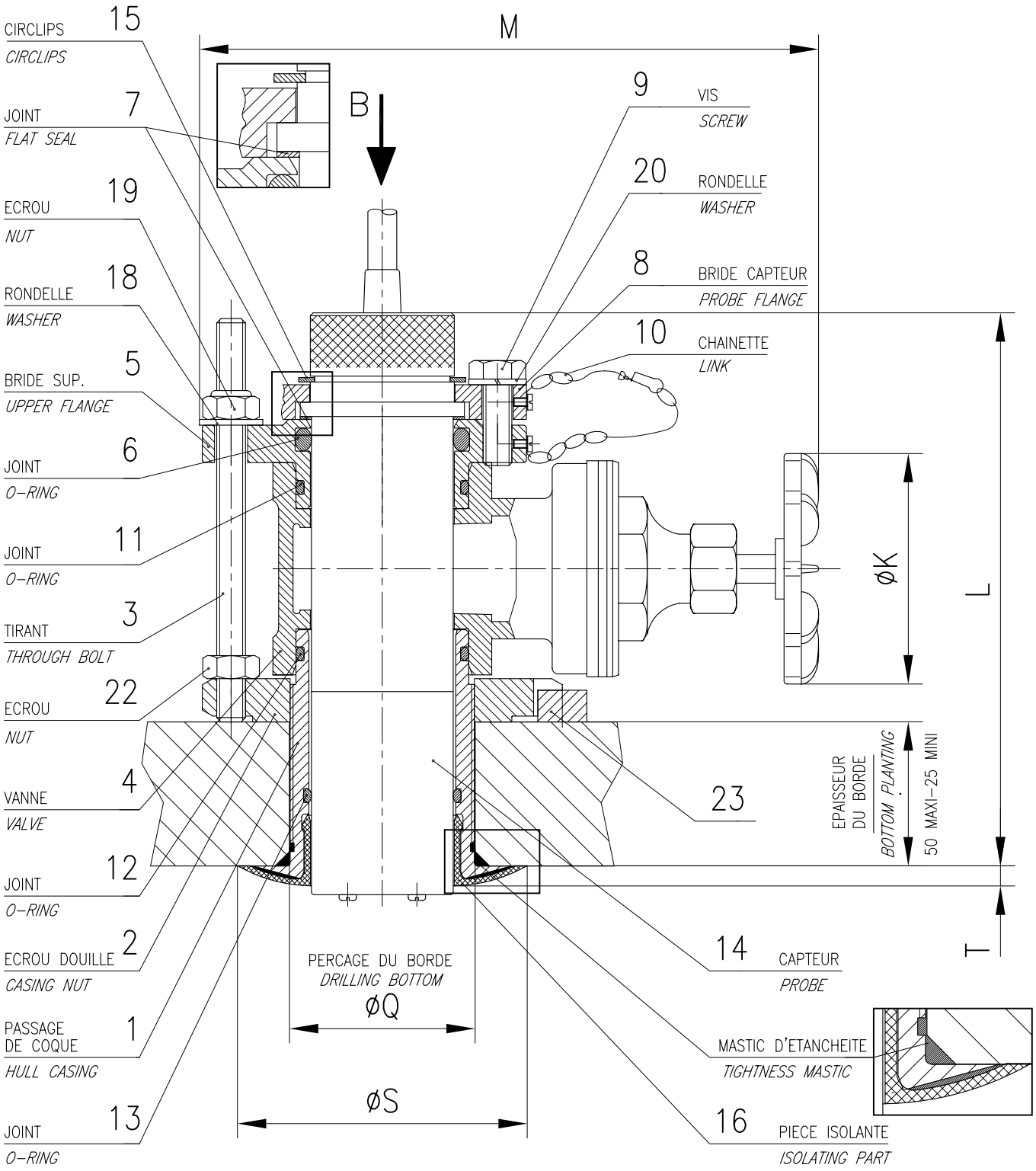
CAPTEUR 481 RVB / PIECE DE COQUE 481 RVB
CAPTEUR 651 RVB / PIECE DE COQUE 651 RVB

PROBE 481 RVB / HULL FITTING 481 RVB
PROBE 651 RVB / HULL FITTING 651 RVB

BEN

N° D 0342 folio 1/4



APPLICABILITE
POUR TOUS TYPE DE NAVIRES

APPLICATION
ALL VESSEL TYPES

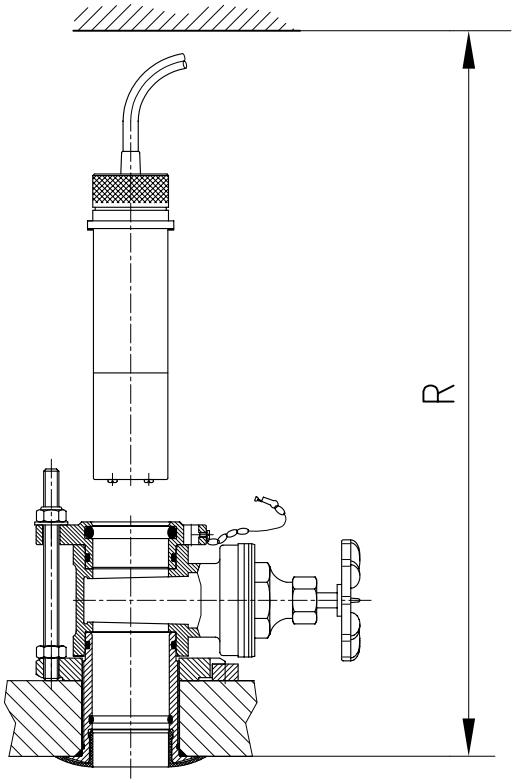
	MATIERE COQUE	*HULL MATERIAL*
481RVB	BOIS PLASTIQUE	*WOOD PLASTIC*
651RVB	BOIS PLASTIQUE ACIER	*WOOD PLASTIC STEEL*

BEN

N° D 0342 folio 2/4

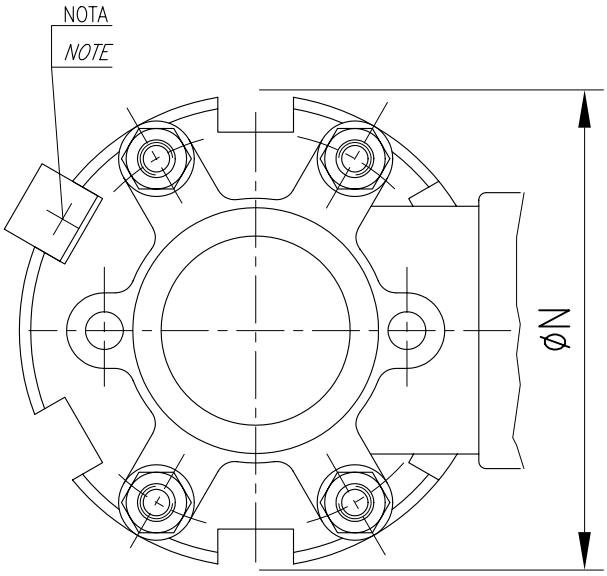
HAUTEUR LIBRE A PREVOIR AU DESSUS
DE L'APPAREIL POUR DEGAGEMENT DU CAPTEUR

CLEARANCE ABOVE FOR PROBE DISMOUNTING



VUE DE DESSUS CAPTEUR RETIRE

VIEW FROM ABOVE WHEN PROBE PULLED OUT



NOTA

EVENTUELLEMENT,PREVOIR L'IMMOBILISATION DE L'ECROU PAR RAPPORT A LA COQUE (FOURNITURE CHANTIER).

NOTE

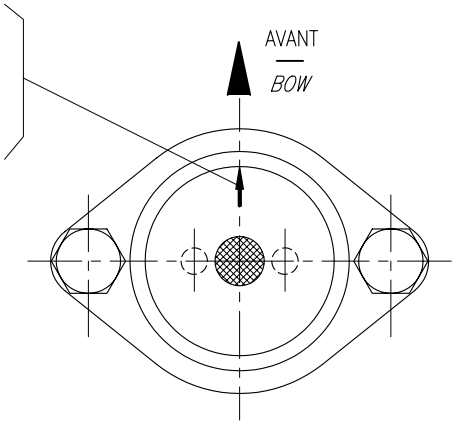
IF POSSIBLE IMMOBILIZE NUT WITH REGARD TO HULL (YARD SUPPLY).

VUE B

B VIEW

FLECHE A POSITIONNER
VERS L'AVANT DU BATEAU

REFERENCE THAT SHALL BE POSITIONED TOWARDS THE BOW



TYPE	K	L	M	N	Q	R	S	T
48	ø100	194	230	ø125	ø64.5	415	ø100	7
65	ø125	244.5	305	ø156	ø93	500	ø130	8.5

- NOTA CONCERNANT LE REP.23 POUR LES CHANTIERS.
  - LE REP.23 SERT DE BLOCAGE A L'ECROU REP.2 PAR RAPPORT A LA COQUE
  - LE FREIN DE L'ECROU SERA SOIT SOUDE SOIT VISSE SUR LA COQUE
  - DANS LE CAS D'UNE COQUE PLASTIQUE,LE FREIN D'ECROU SERA COLLE OU VISSE OU STRATIFIE SUR LA COQUE.

- NOTA CONCERNANT LES COQUES PLASTIQUE POUR LES CHANTIERS.
  - COQUE PLASTIQUE PLEINE PEAU.
    - APRES AVOIR PERCE LA COQUE ENDUIRE LE PERCAGE DE RESINE.
  - COQUE PLASTIQUE TYPE SANDWICH.
    - PREVOIR UN FOURREAU EN BOIS OU EN CONTREPLAQUE ENTRE PIECE DE COQUE ET COQUE POUR EVITER L'ECRASEMENT DE LA COQUE LORS DU SERRAGE DE L'ECROU . CE FOURREAU DOIT FAIRE CORPS AVEC LA COQUE.

- *NOTE FOR SHIPYARDS CONCERNING PART REF.23*
  - *THE PART REF.23 (NUT BREAK) IS USED TO BLOCK THE CASING NUT (REF.2) WITH REGARD TO HULL.*
  - *IT IS WELDED OR SCREWED ON THE HULL.*
  - *FOR PLASTIC HULL , IT IS STICKED , SCREWED OR STRATIFIED ON THE HULL.*

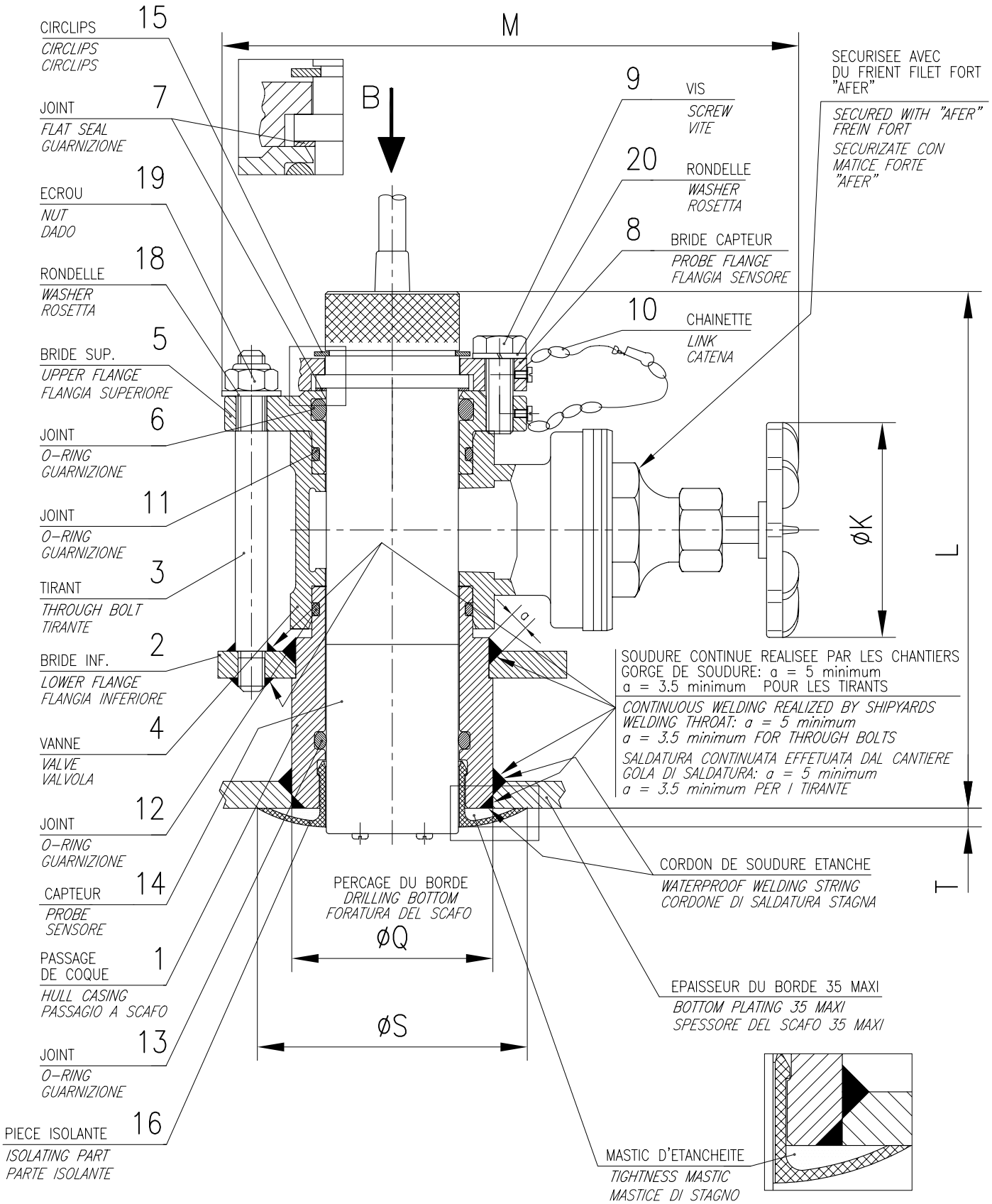
- *NOTE FOR SHIPYARDS CONCERNING PLASTIC HULL.*
  - *FULL (SOLID) SKIN TYPE PLASTIC HULL.*
    - *AFTER THE DRILLING OF THE HULL , COAT THE HOLE WITH RESIN.*
  - *SANDWICH TYPE PLASTIC HULL.*
    - *USE A WOOD OR PLYWOOD SHEATH BETWEEN THE HULL FITTING AND THE HULL TO AVOID THE CRUSHING OF THE HULL WHEN BLOCKING THE NUT. THE SHEATH MUST FORM A PART WITH THE HULL.*

REP. *REF.M*	MATIERE *MATERIAL*	N° PLANS *DRAWING*	CODE
1	CU SN 12	3761-M 5751-M	
2	CU SN 12	3762-M 5752-M	
3	Z2CND17-12-03 316L	4666-M	
4	CU PB5 SN5 ZN5	3742-M 3945-M	
5	CU SN 12	3743-M 5754-M	
6	PERBUNAN		
7	HYDROILIT		
8	CU SN 12	3744-M 5755-M	
9	Z2CN18.10 304L		
10	Z2CN18.10 304L		
11	PERBUNAN		
12	PERBUNAN		
13	PERBUNAN		
14	CU SN 9P	3723-M E0661	
15	BRONZE		
16	NORYL	3745-M 5756-M	
18	Z2CN18.10 304L		
19	Z2CN18.10 304L		
20	Z2CN18.10 304L		
22	Z2CN18.10 304L		

CAPTEUR 481 RVB / PIECE DE COQUE 481 RVI
CAPTEUR 651 RVB / PIECE DE COQUE 651 RVI

PROBE 481 RVB / HULL FITTING 481 RVI
PROBE 651 RVB / HULL FITTING 651 RVI

SENSORE 481 RVB / PASSAGIO A SCAFO 481 RVI
SENSORE 651 RVB / PASSAGIO A SCAFO 651 RVI



APPLICABILITE POUR TOUS TYPE DE NAVIRES COQUE ACIER

APPLICATION ALL VESSEL TYPES STEEL HULL

APPLICABILE PER OGNI TIPI DI NAVE SCAFO IN ACCIAIO

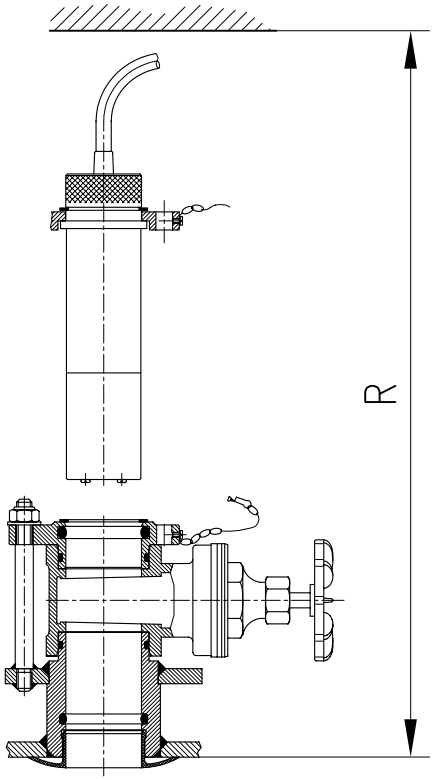
BEN

N° D 0343 B folio 2/5

HAUTEUR LIBRE A PREVOIR AU DESSUS
DE L'APPAREIL POUR DEGAGEMENT DU CAPTEUR

CLEARANCE ABOVE FOR PROBE DISMOUNTING

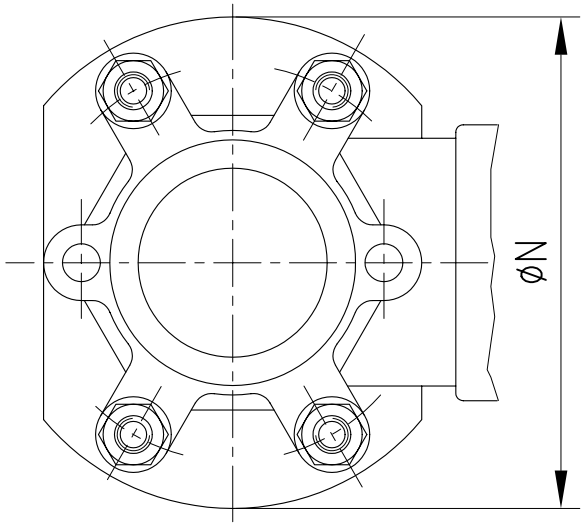
ALTEZZA LIBERA DA LASCIARE SOPRA L'APPARECHIO PER RITIRO DEL SENSORE



VUE DE DESSUS CAPTEUR RETIRE

VIEW FROM ABOVE WHEN PROBE PULLED OUT

VISTA DI SOPRA SENSORE RITIRATO



VUE B

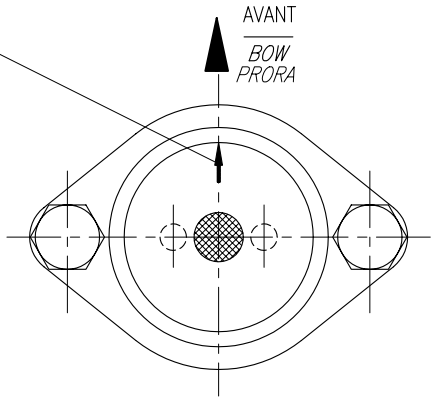
B VIEW

VISTA B

FLECHE A POSITIONNER
VERS L'AVANT DU BATEAU

REFERENCE THAT SHALL BE POSITIONED TOWARDS THE BOW

FRECCIA DA INDIVIDUARE VERSO LA PRORA



TYPE *TYPE* *TYPO*	K	L	M	N	Q	R	S	T
48	ø100	194	230	ø130	ø77	415	ø100	7
65	ø125	244.5	305	ø160	ø92	500	ø130	8.5

– NOTA POUR LES CHANTIERS.

– PREPARATION DE LA COQUE:

– FAIRE UN TROU øQ DANS LE BORDE.
– FAIRE UN CHANFREIN D'ENTREE DE 5mm A 45°.
– DRESSER LA COQUE SUR UN øS.

– APRES SOUDURE DU PIQUAGE SUR LA COQUE:

– PEINDRE L'EXTERIEUR DU PIQUAGE PAR L'INTERIEUR DE LA COQUE APRES SOUDURE DE LA BRIDE REP.2 SUR LE PIQUAGE TOUT EN PRESERVANT L'EXTREMITE SUPERIEURE SIEGE DU JOINT D'ETANCHEITE REP.12 AVEC DE LA PEINTURE TYPE : ZINC EPOXY OU ZINC SILICATE.

– *NOTE FOR SHIPYARDS.*

– HULL PREPARATION:

– DRILL A HOLE øQ IN THE HULL.
– MAKE AN INLET CHAMFER OF 5mm AT 45°.
– STRAIGHTEN THE HULL ON THE øS.

– AFTER THE WELDING OF THE HULL CASING (REF.1) ON THE HULL.

– AFTER THE WELDING OF THE LOWER FLANGE (REF.2) ON THE HULL CASING (REF.1) AND WHILE PROTECTING THE UPPER PART (WHERE O–RING REF.12 IS LOCATED), PAINT THE OUTSIDE OF THE HULL CASING (REF.1) WITH A PAINT TYPE : ZINC EPOXY OR ZINC SILICATE.

– *NOTA PER I CANTIERI*

– PREPARAZIONE DELLO SCAFO:

– PRATICARE UN FORO øQ NEL SCAFO
– PRATICARE UNA MODANATURA D'INGRESSO DI 5mm A 45°
– TORNIRE IL SCAFO SU UN øS

– DOPO SALDATURA DELL' IMPUNTITURA DELLO SCAFO

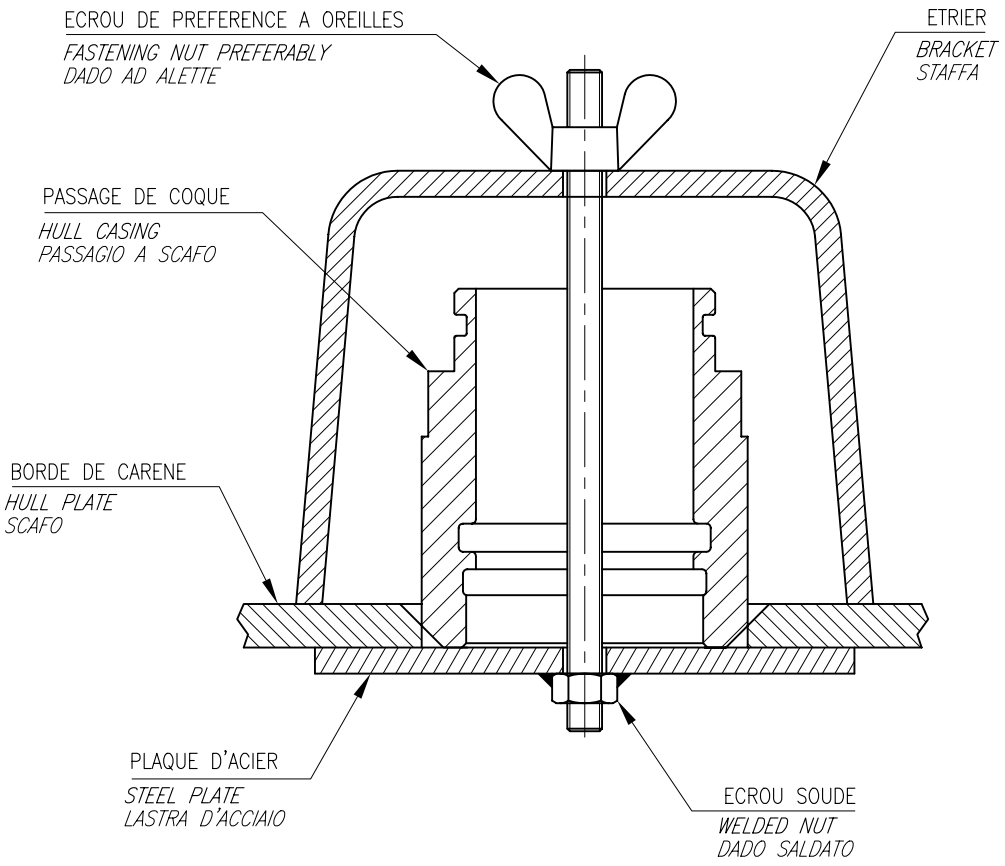
– DIPINGERE L'ESTERNO DELL' IMPUNTITURA DAL' INTERNO DELLO SCAFO DOPO SALDATURA DELLA FLANGIA RIF. 2 SULL IMPUNTITURA, PRESERVANDO L'ESTREMITA SUPERIORE DELLA GUARNIZIONE DI STAGNO RIF.12 CON PITTURA TIPO: ZINCO EPOXY O ZINCO SILICATO.

REP. *REF.M* *RIF.*	MATIERE *MATERIAL* *MATERIE*	N° PLANS *DRAWING* *PIANTA*
1	Z3CND17–12–03 316L	3739–M 5757–M
2	Z3CND17–12–03 316L	3740–M 5758–M
3	Z3CND17–12–03 316L	3741–M 5759–M
4	CU PB5 SN5 ZN5	3742–M 3945–M
5	CU SN 12	3743–M 5754–M
6	PERBUNAN	
7	HYDROILIT	
8	CU SN 12	3744–M 5755–M
9	Z2CN18.10 304L	
10	Z2CN18.10 304L	
11	PERBUNAN	
12	PERBUNAN	
13	PERBUNAN	
14	CU SN 9P	3723–M E0661
15	BRONZE	
16	NORYL	3745–M 5756–M
18	Z2CN18.10 304L	
19	Z2CN18.10 304L	
20	Z2CN18.10 304L	

OUTILLAGE PRECONISE POUR SOUDURE

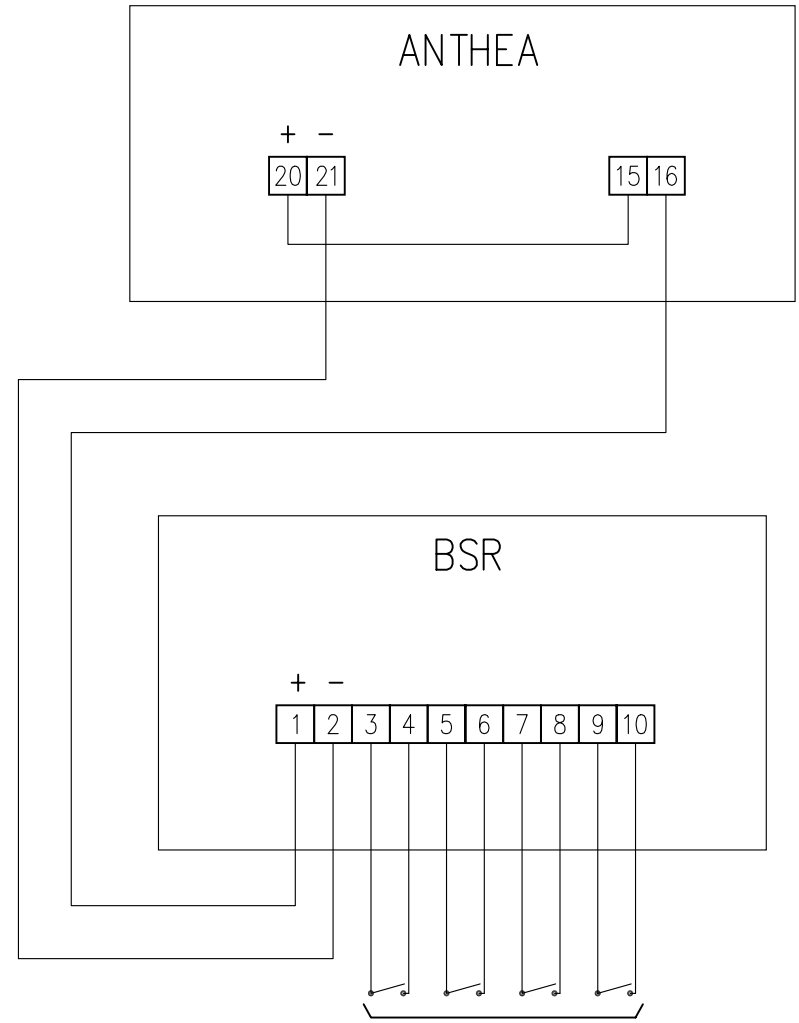
ADJUSTED SYSTEM FOR WELDING

ATTREZZATURA PRECONIZZATO PER SALDARE



BEN

N° D 0343 B folio 5/5



0	09.07.97	Version initiale	ALLEGRE	NOUGIER
Ind.	Date	Modifications	Dessine	Verifie

Matiere	: –	Tol. Gen.	: –
Traitement	: –	Usinage	: –
Protection	: –	Echelle	: –

i2e S.A.
ZAC de Pichaury II
Les Milles 13794
Aix en Provence Cedex03

Titre : ANTHEA / BSR
CABLAGE / CABLING

Format : A4	Folio : 1/1	Ind. 0
F7582		N° : 11850–C

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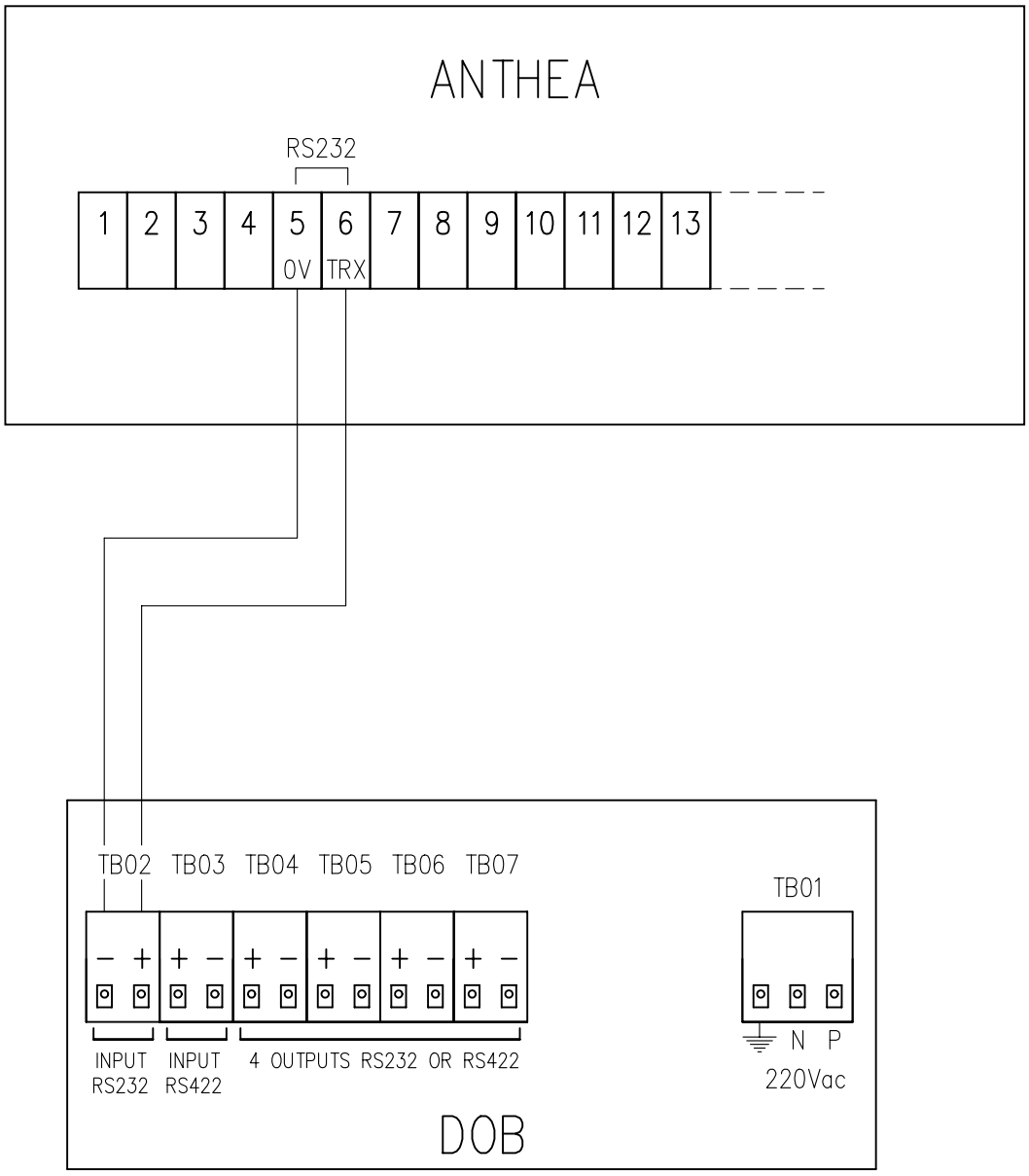
11850–C.DWG



GROUPE i2e DiFFUSiON

ZAC de Pichaury II
BP102000
13793 AIX EN PROVENCE
CEDEX 3

DOB CONNECTION

CONNEXION DOB

Dess. *Drawn.*	Ver. *Chec.*	Date *Date*	Folio: 1/1	Ind. 0
ALLEGRE	NOUGIER	10/09/02	N° : F0189-C	

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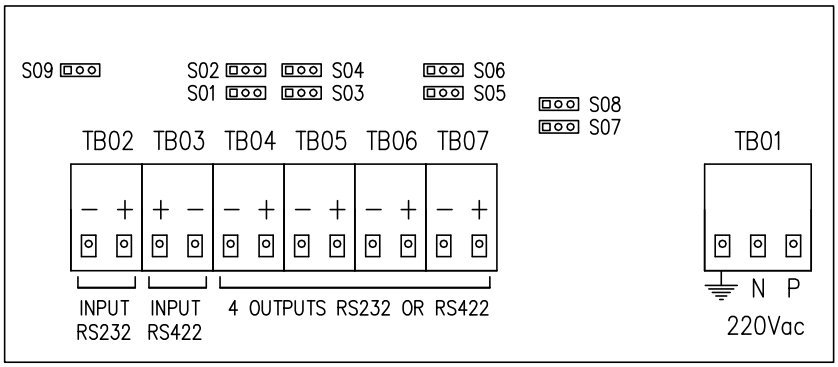
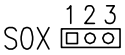
F0189-C.DWG

DOB 232/422





USER'S INSTRUCTION

INPUT/OUTPUT	DESCRIPTION	RS232/RS422	STRAP	MARK
INPUT	TB03	RS422	S09	2–3
INPUT	TB02	RS232	S09	1–2
OUTPUT	TB04	RS422	S01 and S02	1–2
	TB05	RS422	S03 and S04	1–2
	TB06	RS422	S05 and S06	1–2
	TB07	RS422	S07 and S08	1–2
OUTPUT	TB04	RS232	S01 and S02	2–3
	TB05	RS232	S03 and S04	2–3
	TB06	RS232	S05 and S06	2–3
	TB07	RS232	S07 and S08	2–3

GROUPE i2e DiFFUSiON
ZAC de Pichaury II
BP102000
13793 AIX EN PROVENCE
CEDEX 3

DOB 232/422 CONFIGURATION
–
CONFIGURATION DOB 232/422
–

Dess. *Drawn.*	Ver. *Chec.*	Date *Date*	Folio: 1/1	Ind. 0 A
ALLEGRE	ZELMAT	01/12/03	N° : F0256–C	

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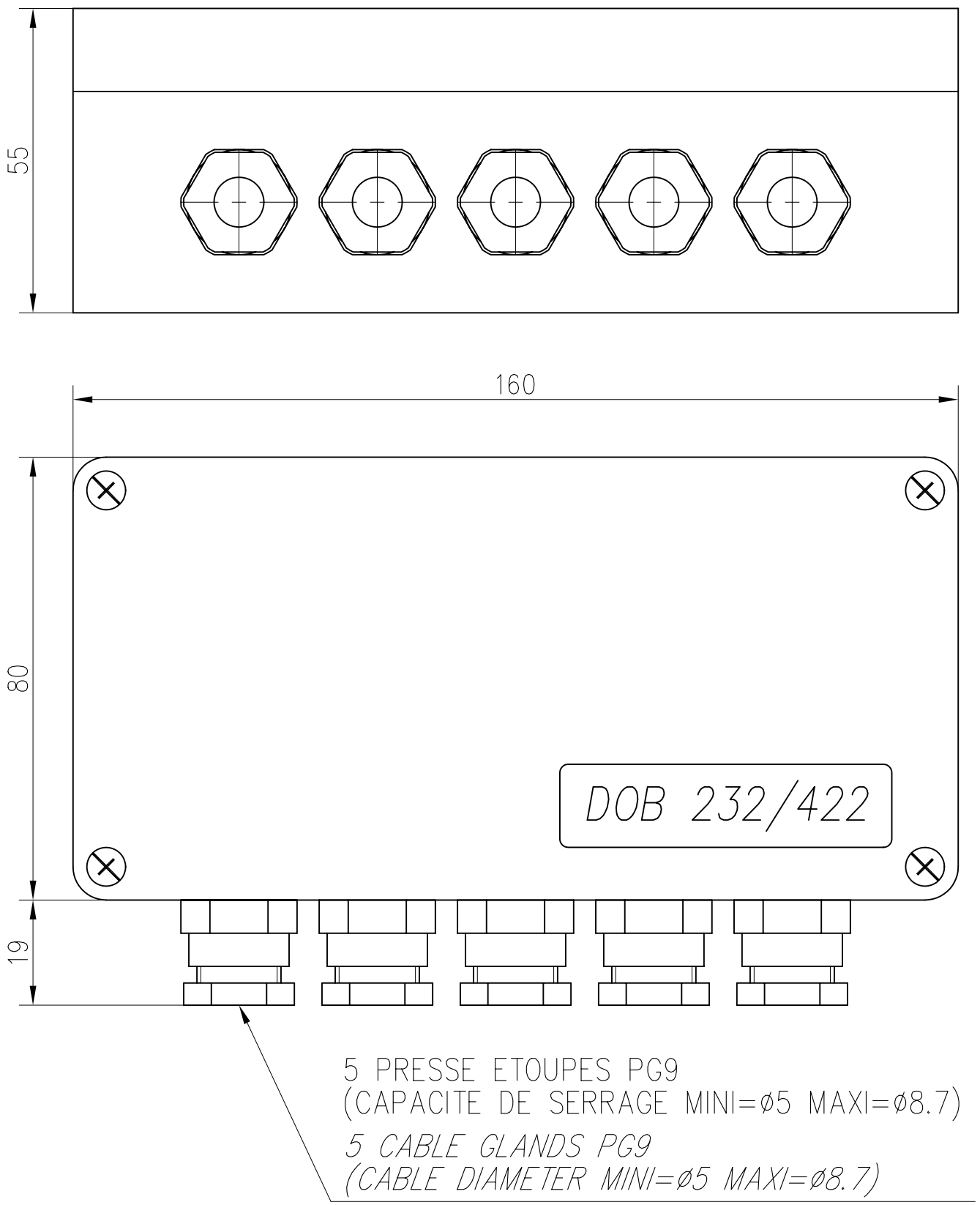
F0256A–C.DWG

ENCOMBREMENT
OUTLINES



PERCAGE POUR FIXATION
DRILLIND FOR MOUNTING

GROUPE i2e DiFFUSiON

ZAC de Pichaury II
BP102000
13793 AIX EN PROVENCE
CEDEX 3

DOB 232/422
ENCOMBREMENT ET POSE
DOB 232/422
OUTLINES AND MOUNTING

Dess. *Drawn.*	Ver. *Chec.*	Date *Date*	Folio: 1/1	Ind. 0
ALLEGRE	NOUGIER	12.09.2001	N° : F0344-M	

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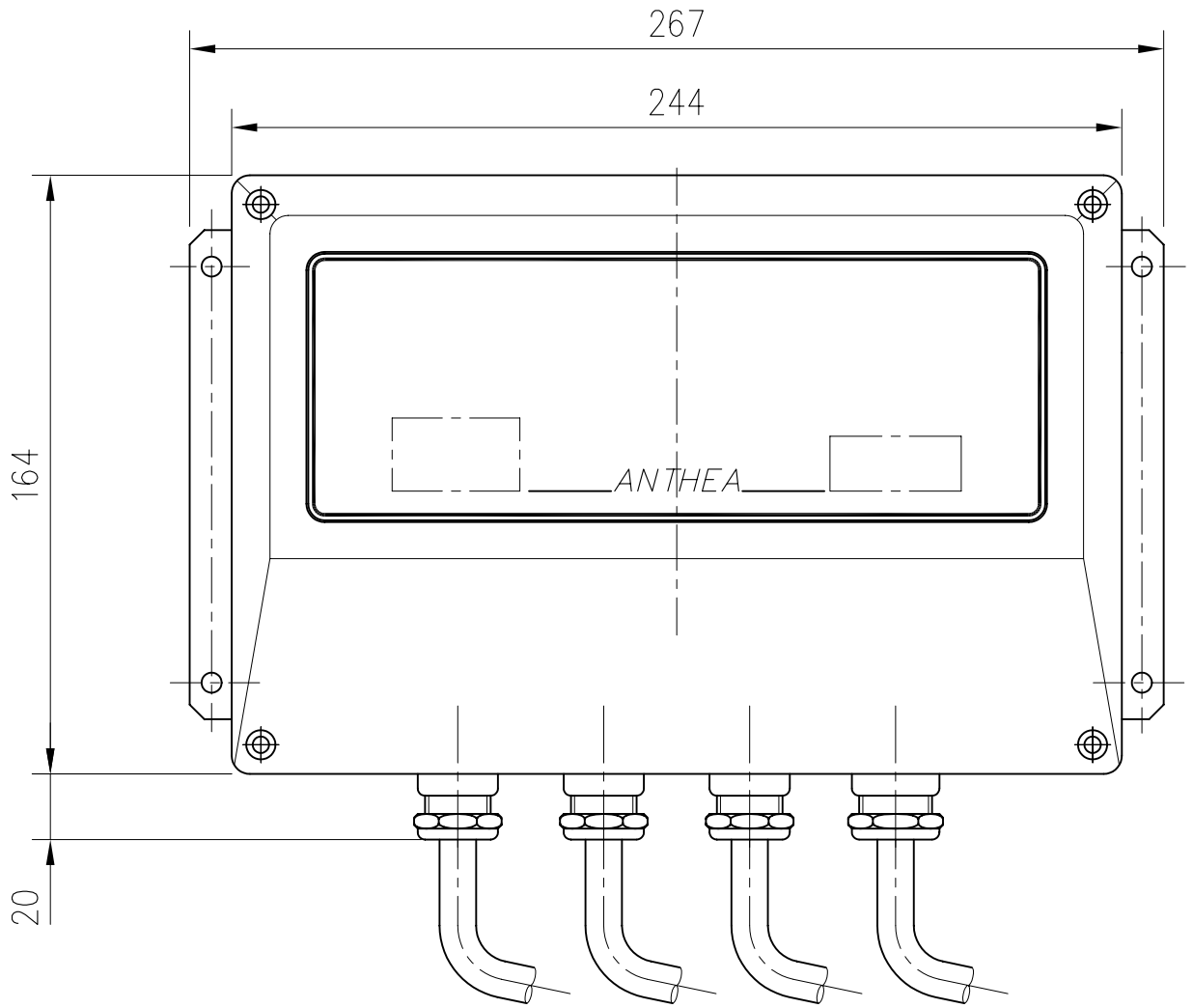
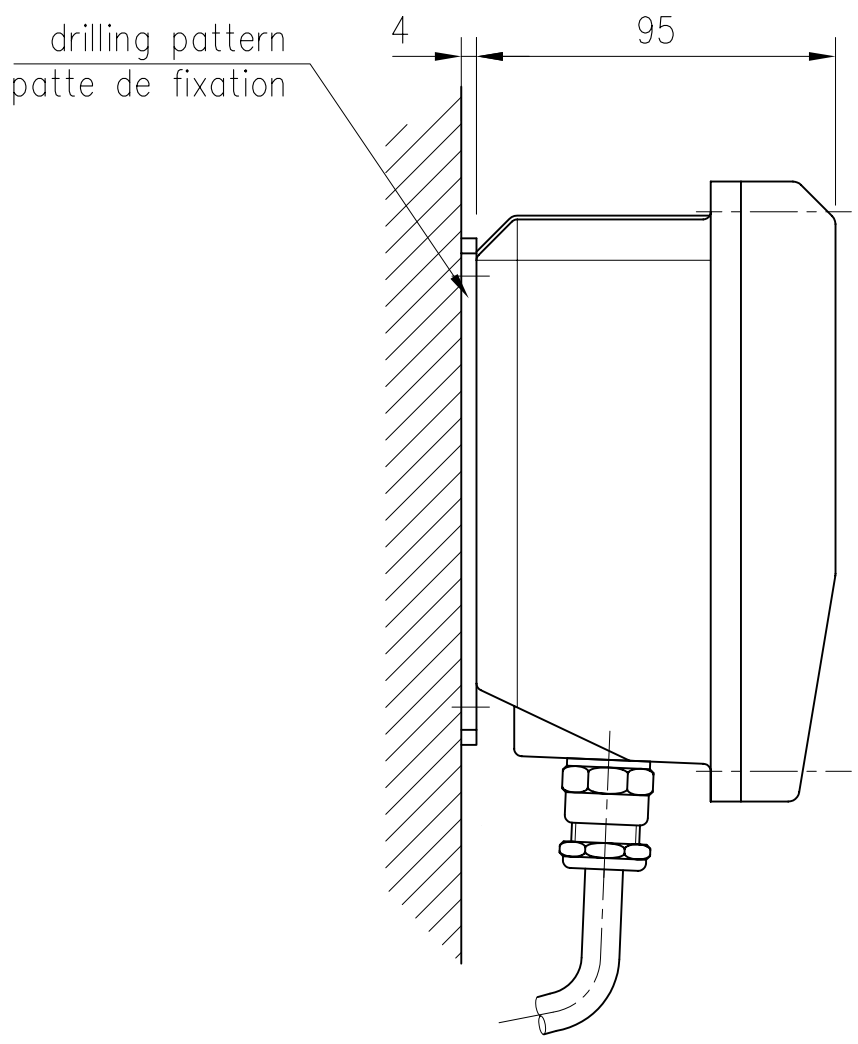
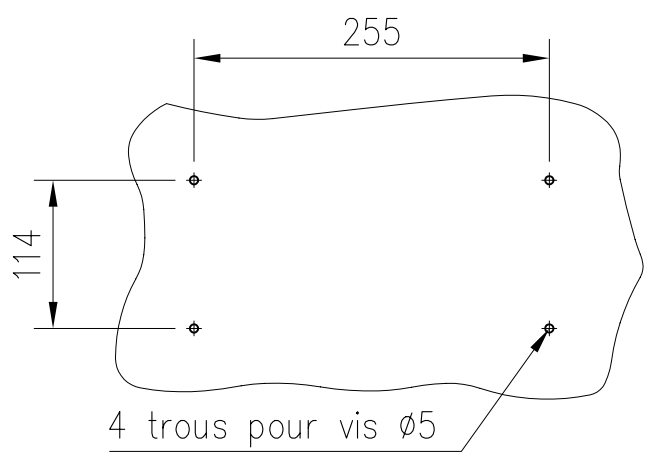
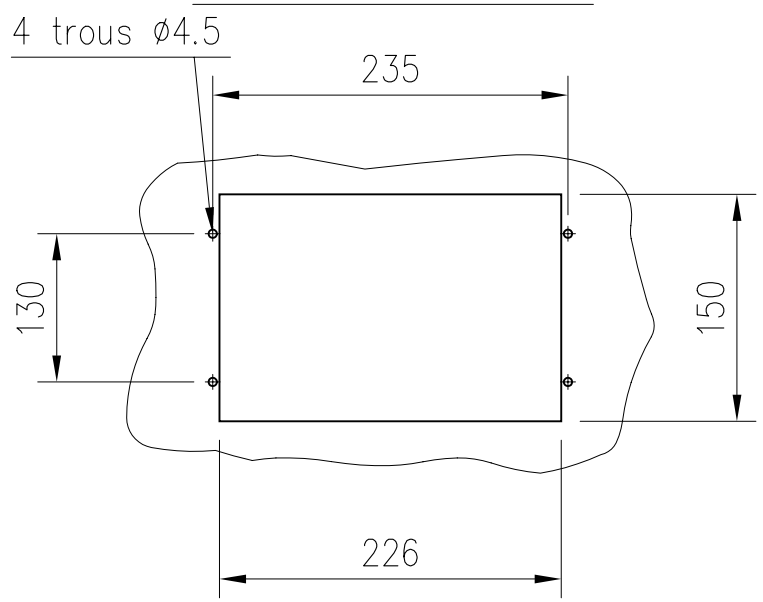




FIXATION – BULK HEAD–
–PLAN DE PERCAGE
MONTAGE AVEC PATTES DE FIXATION–



FLUSH MOUNTED
–PLAN DE PERCAGE
MONTAGE ENCASTRE–



Ind.	Date	Modifications	Dessine	Verifie
A	25.09.96	CHANGEMENT PATTES DE FIXATION EN ACCORD AVEC FABRICATION ENTRE–AXES 98X235 DEVIENT 114X255	ALLEGRE	NOUGIER
0	17.10.95	Version initiale	F.CANDEL	NOUGIER

Matiere	: –	Tol. Gen.	: –
Traitement	: –	Usinage	: –
Protection	: –	Echelle	: 1/2

i2e S.A.
ZAC de Pichaury II
Les Milles 13794
Aix en Provence Cedex03

Titre : ANTHEA BLIND–MOUNTING
ENCOMBREMENT ET POSE

Format : A3	Folio : 1/1	Ind. 0 A
F7582		N° : 6631–M

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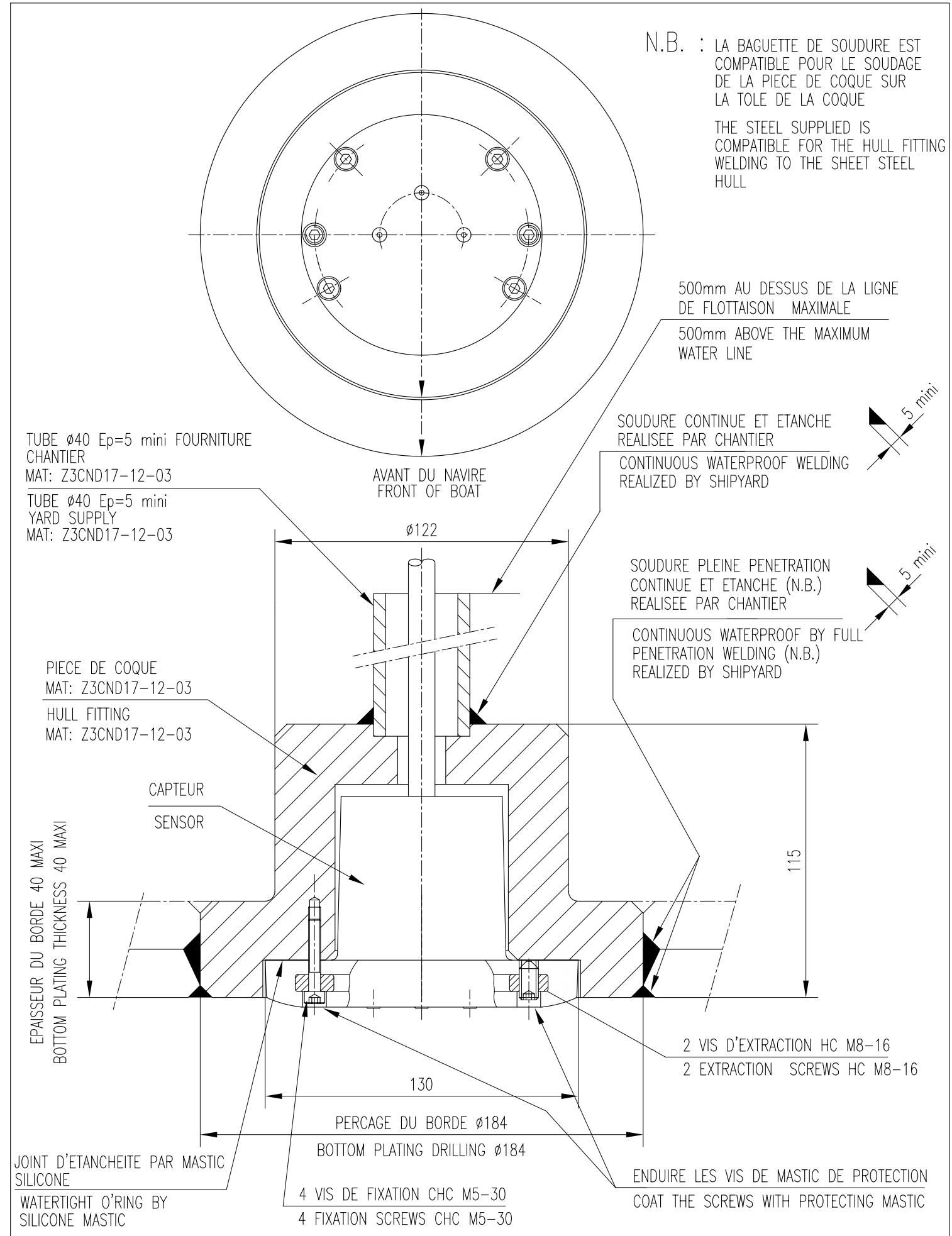
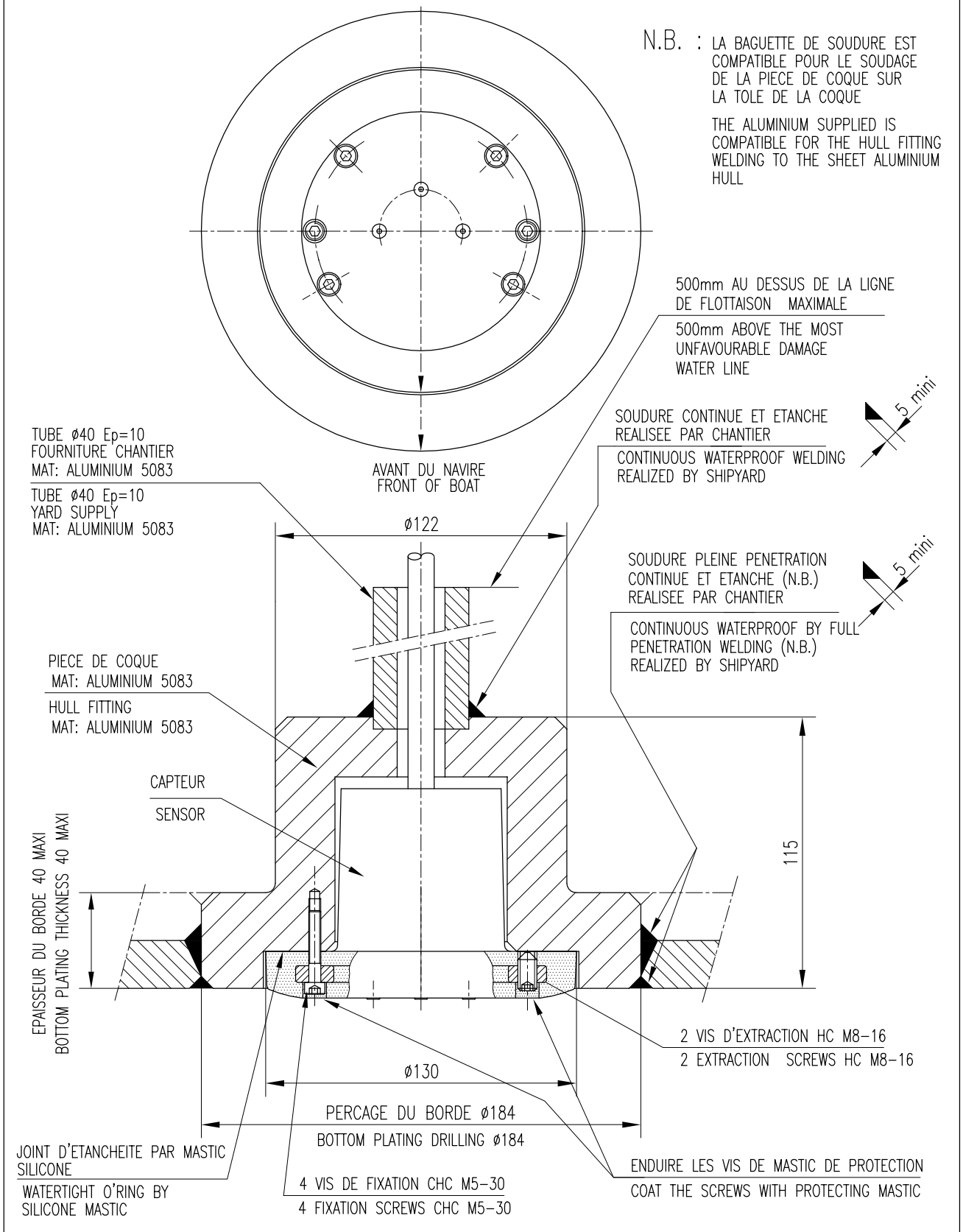
6631A–M.DWG


N.B. : LA BAGUETTE DE SOUDURE EST COMPATIBLE POUR LE SOUDAGE DE LA PIECE DE COQUE SUR LA TOLE DE LA COQUE
THE STEEL SUPPLIED IS COMPATIBLE FOR THE HULL FITTING WELDING TO THE SHEET STEEL HULL
500mm AU DESSUS DE LA LIGNE DE FLOTTAISON MAXIMALE
500mm ABOVE THE MAXIMUM WATER LINE
5 mini
SOUDURE CONTINUE ET ETANCHE REALISEE PAR CHANTIER
CONTINUOUS WATERPROOF WELDING REALIZED BY SHIPYARD
TUBE ø40 Ep=5 mini FOURNITURE CHANTIER
MAT: Z3CND17-12-03
TUBE ø40 Ep=5 mini YARD SUPPLY
MAT: Z3CND17-12-03
AVANT DU NAVIRE
FRONT OF BOAT
ø122
SOUDURE PLEINE PENETRATION CONTINUE ET ETANCHE (N.B.) REALISEE PAR CHANTIER
CONTINUOUS WATERPROOF BY FULL PENETRATION WELDING (N.B.) REALIZED BY SHIPYARD
PIECE DE COQUE
MAT: Z3CND17-12-03
HULL FITTING
MAT: Z3CND17-12-03
CAPTEUR
SENSOR
EPAISSEUR DU BORDE 40 MAXI
BOTTOM PLATING THICKNESS 40 MAXI
115
2 VIS D'EXTRACTION HC M8-16
2 EXTRACTION SCREWS HC M8-16
130
PERCAGE DU BORDE ø184
BOTTOM PLATING DRILLING ø184
JOINT D'ETANCHEITE PAR MASTIC SILICONE
WATERTIGHT O'RING BY SILICONE MASTIC
4 VIS DE FIXATION CHC M5-30
4 FIXATION SCREWS CHC M5-30
ENDUIRE LES VIS DE MASTIC DE PROTECTION
COAT THE SCREWS WITH PROTECTING MASTIC

BEN

CAPTEUR LENTILLE ET PIECE DE COQUE
LENS SENSOR AND HULL FITTING

N° 7851-M IND. A


N.B. : LA BAGUETTE DE SOUDURE EST COMPATIBLE POUR LE SOUDAGE DE LA PIECE DE COQUE SUR LA TOLE DE LA COQUE
THE ALUMINIUM SUPPLIED IS COMPATIBLE FOR THE HULL FITTING WELDING TO THE SHEET ALUMINIUM HULL
500mm AU DESSUS DE LA LIGNE DE FLOTTAISON MAXIMALE
500mm ABOVE THE MOST UNFAVOURABLE DAMAGE WATER LINE
AVANT DU NAVIRE
FRONT OF BOAT
TUBE ø40 Ep=10
FOURNITURE CHANTIER
MAT: ALUMINIUM 5083
TUBE ø40 Ep=10
YARD SUPPLY
MAT: ALUMINIUM 5083
SOUDURE CONTINUE ET ETANCHE REALISEE PAR CHANTIER
CONTINUOUS WATERPROOF WELDING REALIZED BY SHIPYARD
5 mini
ø122
SOUDURE PLEINE PENETRATION CONTINUE ET ETANCHE (N.B.) REALISEE PAR CHANTIER
CONTINUOUS WATERPROOF BY FULL PENETRATION WELDING (N.B.) REALIZED BY SHIPYARD
5 mini
PIECE DE COQUE
MAT: ALUMINIUM 5083
HULL FITTING
MAT: ALUMINIUM 5083
CAPTEUR
SENSOR
115
EPAISSEUR DU BORDE 40 MAXI
BOTTOM PLATING THICKNESS 40 MAXI
2 VIS D'EXTRACTION HC M8-16
2 EXTRACTION SCREWS HC M8-16
ø130
PERCAGE DU BORDE ø184
BOTTOM PLATING DRILLING ø184
JOINT D'ETANCHEITE PAR MASTIC SILICONE
WATERTIGHT O'RING BY SILICONE MASTIC
4 VIS DE FIXATION CHC M5-30
4 FIXATION SCREWS CHC M5-30
ENDUIRE LES VIS DE MASTIC DE PROTECTION
COAT THE SCREWS WITH PROTECTING MASTIC

GROUPE i2e DiFFUSiON

ZAC de Pichaury II
BP102000
13793 AIX EN PROVENCE
CEDEX 3

CAPTEUR LENTILLE ET PIECE DE COQUE ALUMINIUM

—

LENS SENSOR AND ALUMINIUM HULL FITTING

—

Dess. *Drawn.*	Ver. *Chec.*	Date *Date*	Folio: 1/1	Ind. 0
ALLEGRE	NOUGIER	18/10/2001	N° : F0354-M	

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F0354-M.DWG

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08293/B0 EC
File Number : NAV 05/1356/01
MED item number : **A.1/4.7**
This Certificate is not valid where presented without the full attached Schedule composed of 10 sections.

EUROPEAN COUNCIL DIRECTIVE 96/98 EC on MARINE EQUIPMENT (M.E.D.)

EC TYPE EXAMINATION CERTIFICATE
(CERTIFICATE OF TYPE APPROVAL)

This is to certify that Bureau Veritas, acting within the scope of its notification , did undertake the relevant type approval procedures for the equipment identified below which was found to be in compliance with the International Instruments and testing standards under the requirements of Council Directive 96/98/EC, as amended.

SPEED AND DISTANCE MEASURING EQUIPMENT (SDME)
Ship speed log ANTHEA

MANUFACTURED BY:

I2E DIFFUSION
Aix-en-Provence - FRANCE

REGULATIONS & STANDARDS in accordance with Council Directive 96/98/EC, as amended by Commission Directive 2002/75/EC :
SOLAS 74, as amended, Regs. V/19.2.3.4 - IMO Resolution : A.824(19), as amended by MSC 96(72) ; IMO Resolution A.694(17) - MSC 97(73) 13.3 (2000 HSC Code) ; IEC 61023 (1999), IEC 60945 (1996), IEC 61162.

Expiry date: 16/12/2008

Local Office : BUREAU VERITAS MARSEILLES

At Paris la Défense, on : 16/12/2003

E. DANION
Responsable Marine
Secteur Sud

BUREAU VERITAS EXPERTS PARIS 1828 DE MARSEILLE REGISTRE INTERNATIONAL

J.BENOIT
Marine Equipment Certification Manager
For BUREAU VERITAS, EC Notified Body N°0062

The Manufacturer is allowed to affix the MED Conformity Mark to approved equipment and issue a Declaration of Conformity, only when the production/product assessment module referred to in the Directive 96/98/EC, is fully complied with.
This Certificate remains valid until its date of expiry, unless cancelled or revoked, providing the conditions in the attached Schedule are complied with and the equipment remains satisfactory in service.This Certificate does not apply to equipment which has been varied or modified from the specimen tested.
Should the specified standards be amended during the validity of this Certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the ammended standards apply.
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Issued under the authority of the French Maritime Administration.

BUREAU VERITAS
MARINE DIVISION

File Number : NAV 05/1356/01

THE SCHEDULE OF APPROVAL

1. PRODUCT DESCRIPTION :

The ship speed log type **Anthea** consists of two versions as follows, both being supplied by 24 Vcc (+30% -10%) or 220 Vac 50/60 Hz, or 110Vac 50/60 Hz (+/-10%).

- **1.1 The standard equipment** which includes:

1.1.1 One main cabinet with:

- One LCD screen for digital and pseudo-analog speed display
- Double scale: 25 or 50 knots
- One electromechanical mile totalizer
- One daily mile totalizer (on LCD)
- One display unit for the different alarm thresholds adjustments (high and low) and 3 calibration points adjustments
- One dimmer
- One output serial line available on RS422 or RS232 standard (IEC 61162)

1.1.2 One 48.1 RVB 16 sensor, retractable at sea

1.1.3 One hull fitting with valve, 48.1 RVB (screw-on type)
or
1.1.4 One hull-fitting valve, 48.1 RVI (weld-on type)

1.1.5 One Lens sensor with Lens hull-fitting

1.1..6 Options:

- GA120 analog speed and distance repeater
- RGD100 combined digital repeater for speed and distance
- XY version

- **1.2 BLIND ANTHEA and DEBEG 4671 reference** which includes:

- One blind cabinet with one output serial line available on RS422 or RS232 standard (IEC 61162), with 3 calibration points adjustments and alarm thresholds adjustments (high and low).
- One sensor 48.1 RB or 48.1.RVB.16 sensor removable at sea

- One hull fitting 48.1 RB without valve (screw-on type) or 48.1.RVI (weld on type)

- or one Lens sensor with Lens hull fitting

- **1.3 Options:**

- GA 120 analog speed and distance repeater

- RGD 100 combined digital speed and distance repeater

- Blind cabinet with linearization correction

- X/Y version.

2. DESIGN DRAWINGS and/or SPECIFICATIONS

2.1 In accordance with the manufacturer's drawings and documents:

- Operation and installation manual N° 97MU001-C (Anthea) and 03MU002-B (Blind Anthea)
- Report for delivery of the log type Anthea used with RGD100 repeater N° 96EPV007-A, dated 20 March 1996 issued by 12E in France.

2.2 Manufacturing documentation: to be approved by the Society prior to EC ⎈ marking authorization.

2.3 Manual(s) for installation, use and maintenance:
- to be stamped by a Society's Surveyor
- to be available in one of the IMO languages in addition to the ship's flag language.

3. TYPE TEST REPORTS / LABORATORY RECOGNITION STATUS

3.1 Vibration test report N° 500689 CTSN EMI/NP/98 dated 9 April 1998 issued by DGA in France

3.2 Report on type approval testing of the locH ANTHEA in accordance with IEC 60945 and IEC 61023.
Reports:

N° BSH/30/25L/95 dated 7 May 1996
N° 005/96/U dated October 1995
Issued by Federal Maritime and Hydrographic Agency (BSH) Germany
N° 95/905-2 dated 6 November 1995 issued by EMV-Labor MAZ Germany
N° 20/6248/95-S4320 dated 24 August 1995 issued by BSH Germany.
N° BSH/30/25L/1/98 dated 02 July 1998 issued by BSH, Germany.
Report of conformity with IEC 61162 dated 19/09/2002.
N° RG-03-91006/1 dated 18/04/03 issued by EMITECH France
EMC report dated 11/09/02 issued by ESIM France
N° D011785 dated 17/02/03 issued by LNE

4. MATERIALS or COMPONENTS REQUIRED TO BE TYPE APPROVED or TYPE TESTED

Nil.

5. OTHER MATERIALS and/or COMPONENTS

Nil.

6. APPLICATION / LIMITATION OF USE

6.1 In drydock, never paint nor grease the electrodes of the sensor.

6.2 According to vessel size

- Hull-fittings with valve (48.1 RVI - 48.1 RVB - 65.1 RVI - 65.1 RVB)
  * are used on all types of vessels

- Hull-fittings without valve (48.1 RB - 48.1 RA - 48.1 RBL - 48.1 RI) are used on:
  * 500 toners maximum
  * Fishing ships not longer than 45 m
  * Yachts.

6.3 Hull fitting cannot be used in dangerous compartments (fuel, hydrocarbons, chemicals).

6.4 Hull strength must be checked before installation of hull fitting.

6.5 Hull fitting must be installed in compliance with the specifications of the Ship Classification Society.

6.6 Power supply wiring must comply with the specifications of the Ship Classification Society.

7. PRODUCTION SURVEY REQUIREMENTS

7.1 Arrangements shall be made for a Society's Surveyor to carry out, on a periodic basis, visits of the manufacturer's premises and product audits.

7.2 The production conformity assessment Module shall be "D" Production Quality Assurance.

7.3 Each manufactured equipment is to bear the ⎈ conformity mark and number of the Notified Body undertaking surveillance module (where BV, 0062).

7.4 Each electromagnetic log intended to be fitted on board a ship registered with a national register adhering to the Directive shall be delivered with a Declaration of Conformity, which shall be signed by the manufacturer.

7.5 Each equipment is to be supplied with manual(s) for installation, use and maintenance (cf. 2.3 above).

8. ON BOARD INSTALLATION & MAINTENANCE REQUIREMENTS

As per requirements of regulations stated on the front page of the certificate and according to the manufacturer's specifications.

9. MARKING FOR IDENTIFICATION

- Maker's name or trade mark,
- Serial number of the units,
- Equipment type number or model identification under which it was type-tested,
- ⎈ conformity mark and number of the Notified Body undertaking surveillance module (where BV, 0062),
- Last two digits of year mark affixed.

10. OTHERS

10.1 - This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the electromagnetic log at any time, and that **I2E DIFFUSION, 1030 Av. Guillibert de la Lauzière, ZAC de Pichaury II, 13290 LES MILLES - FRANCE,** will accept the responsibility for informing shipbuilders or their sub-contractors of the proper methods of use and general maintenance of the electromagnetic log and the conditions of this approval.

10.2 - This certificate supersedes EC Type Examination Certificate n° 08293/A4 EC issued on 12/09/2003 by the Society.

*** ***Last page (End of Document)*** ***

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